October 20, 1947

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

PUBLIC LIBRARY
OCT 20 1947

EDITORIAL INDEX, PAGE 71

INLAND STEEL

INLAND

the Right Steel
Dependable Service
Friendly Cooperation

RELIANCE MOTORS

PRODUCE WHERE PRESSURES ARE TERRIFIC!

Bars and tubes give under the terrific pressure, but there's no interruption in the dependable performance of Reliance Heavy Duty D-c. Motors which power straighteners.

Where pressures are severest in processing iron and steel, Reliance Heavy Duty D-c. Motors are right in their element! Designed and built, electrically and mechanically, to stand up longer in the toughest going, these rugged motors offer the maximum in dependability and economy. There is a type to satisfy the power requirements of every job where operating conditions demand a heavy duty motor. Call your nearest Reliance Sales Representative!

Reliance Heavy Duty Type T Motor

RELIANCE ELECTRIC & ENGINEERING CO.

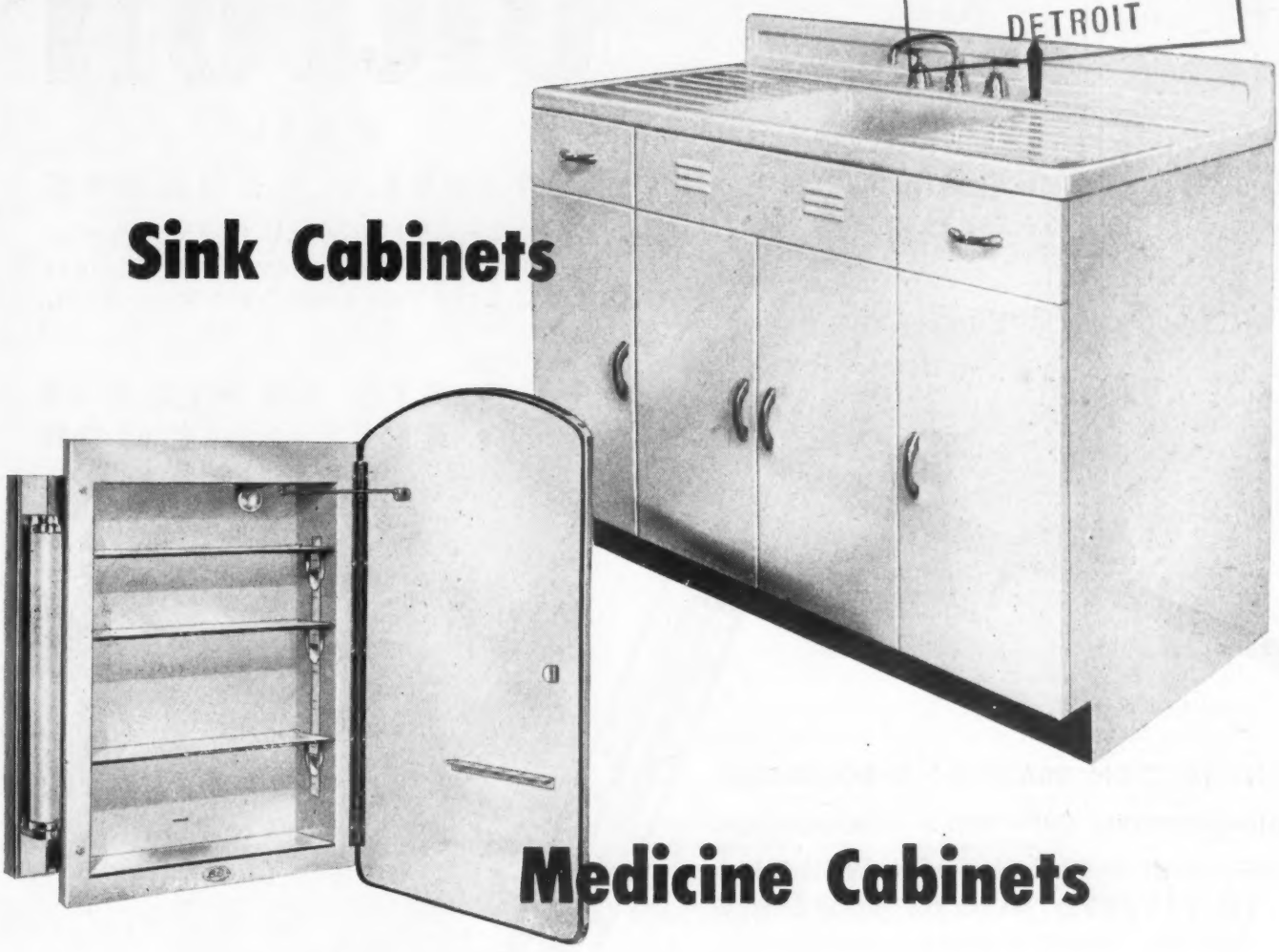
1081 Ivanhoe Road **Cleveland 10, Ohio**

Appleton, Wis. • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Dallas • Denver • Detroit • Gary
Grand Rapids • Greenville, S. C. • Houston • Kansas City • Knoxville • Los Angeles • Milwaukee • Minneapolis
New Orleans • New York • Philadelphia • Pittsburgh • Portland, Ore. • Roanoke, Va. • Rockford
St. Louis • San Francisco • Seattle • Syracuse • Tampa • Tulsa • Washington, D. C. • Sao Paulo, Brazil

RELIANCE A·C D·C MOTORS

For Forming or Stamping

PUBLIC LIBRARY
OCT 20 1947
DETROIT



Sink Cabinets

Medicine Cabinets

The stamping and forming operations that go into the manufacture of streamlined sink cabinets or modern medicine cabinets can become a production headache when the properties of the sheet material varies.

Bethlehem Steel Sheets have the high degree of uniformity that keeps the big presses working at a steady clip. Manufactured on continuous high-speed mills, Bethlehem hot-rolled and cold-rolled sheets have the uniform gage, surface and forming properties needed for all types of sheet-metal products.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

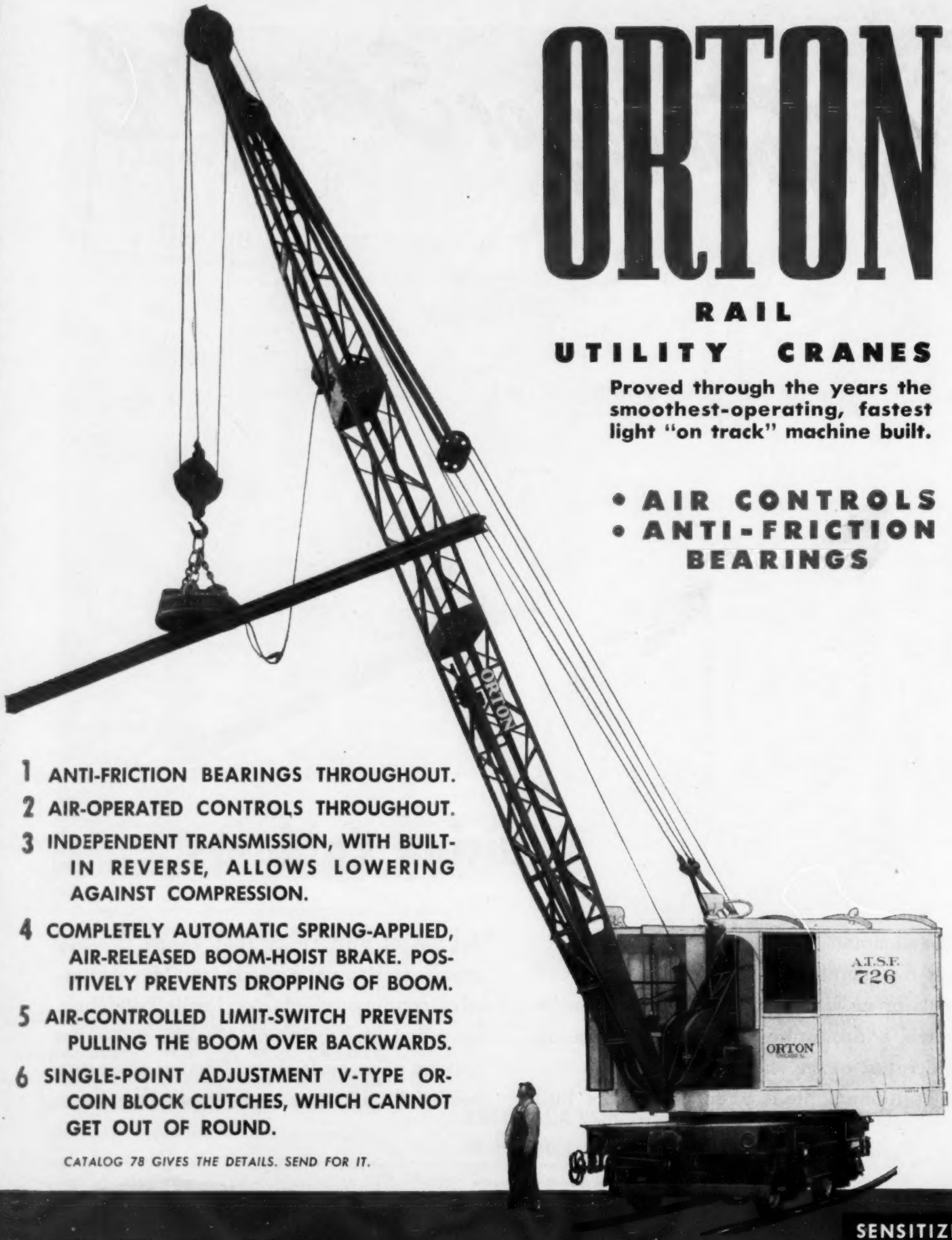
Bethlehem Steel Sheets ★ BETHLEHEM STEEL ★

ORTON

RAIL UTILITY CRANES

Proved through the years the smoothest-operating, fastest light "on track" machine built.

- **AIR CONTROLS**
- **ANTI-FRICTION BEARINGS**



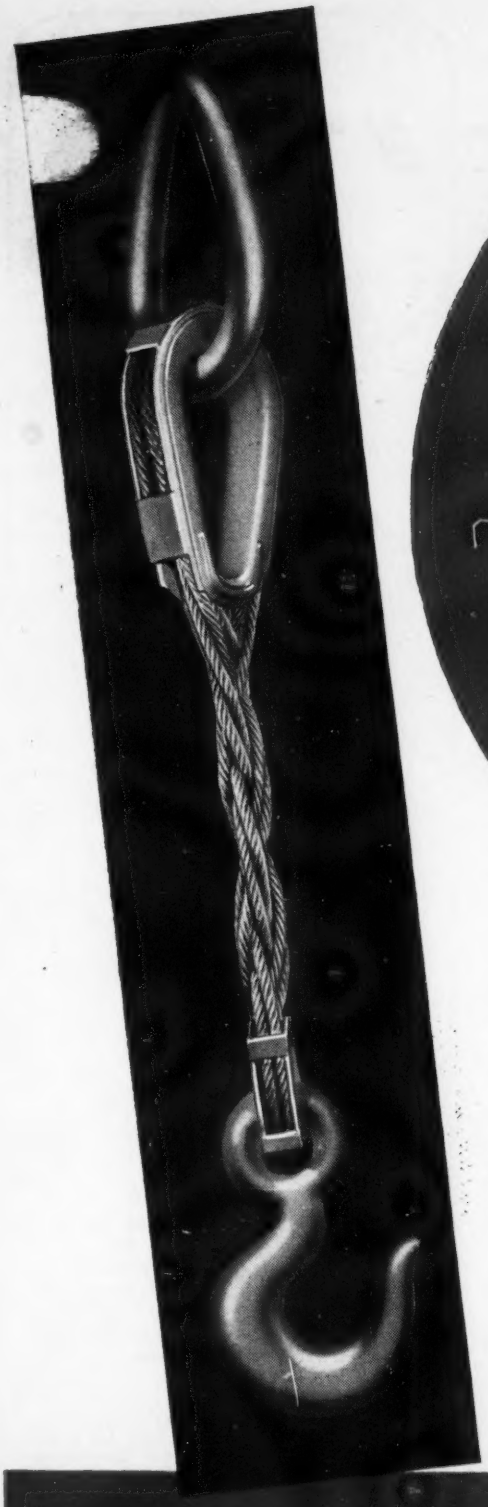
1. ANTI-FRICTION BEARINGS THROUGHOUT.
2. AIR-OPERATED CONTROLS THROUGHOUT.
3. INDEPENDENT TRANSMISSION, WITH BUILT-IN REVERSE, ALLOWS LOWERING AGAINST COMPRESSION.
4. COMPLETELY AUTOMATIC SPRING-APPLIED, AIR-RELEASED BOOM-HOIST BRAKE. POSITIVELY PREVENTS DROPPING OF BOOM.
5. AIR-CONTROLLED LIMIT-SWITCH PREVENTS PULLING THE BOOM OVER BACKWARDS.
6. SINGLE-POINT ADJUSTMENT V-TYPE OR-COIN BLOCK CLUTCHES, WHICH CANNOT GET OUT OF ROUND.

CATALOG 78 GIVES THE DETAILS. SEND FOR IT.

ORTON CRANE & SHOVEL COMPANY
608 S. DEARBORN ST., CHICAGO 5, ILL.

SENSITIZED

POWER



MACWHYTE

Wire Rope Slings are custom-built to your specific requirements . . . designed to assure the correct sling for safe, easy, low-cost handling of your materials.

Macwhyte engineering service is available to help design the correct sling for your job. Our sling engineers will give you the benefit of their broad experience in designing hundreds of slings for handling loads similar to yours. Ask your Macwhyte distributor, or write Macwhyte Company.

Macwhyte also makes: MACWHYTE PREformed and Non-PREformed Internally Lubricated Wire Ropes . . . MONARCH WHYTE STRAND Wire Rope . . . Special Traction Elevator Rope . . . Stainless Steel Wire Rope . . . Monel Metal Wire Rope . . . Galvanized Wire Rope . . . Spring-lay Wire Rope . . . Hi-Fatigue Aircraft Cables, Assemblies and Tie-Rods. *Catalog, literature on request.*

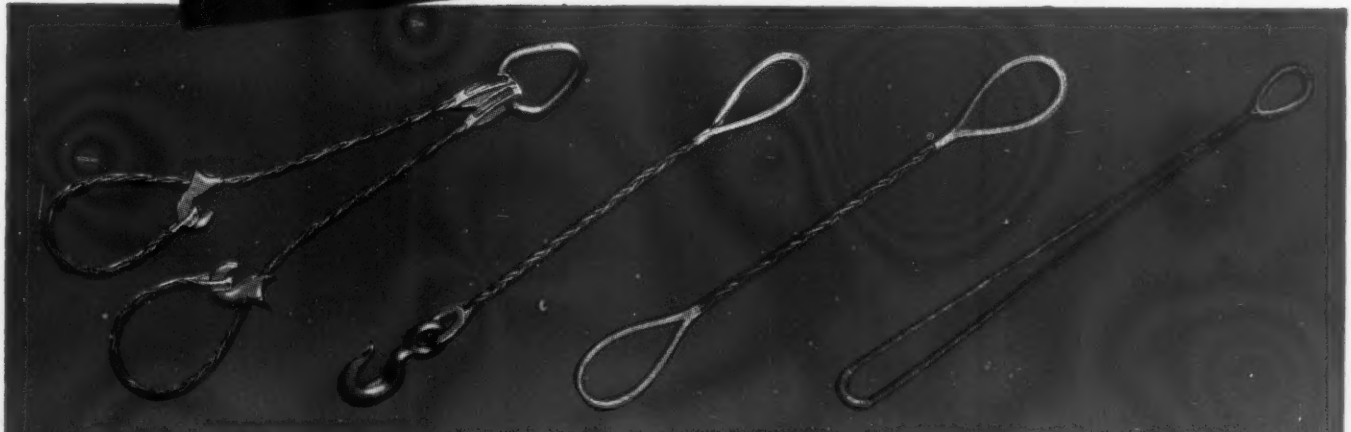
MACWHYTE WIRE ROPE SLINGS

Manufactured by Macwhyte Company
2912 Fourteenth Avenue, Kenosha, Wisconsin

Mill Depots: **New York · Pittsburgh · Chicago · Minneapolis**
Fort Worth · Portland · Seattle · San Francisco · Los Angeles

Distributors throughout the U. S. A. and other countries

NO. 928-B



Make MACWHYTE your headquarters for WIRE ROPE SLINGS

Behind the Scenes...

Hundreds Every Issue

One of the old adages in the publishing business is that "names make news". Just for fun we decided to check last week's book and find out how many names made the news. We discovered that 240 men managed to get their names in the book, including a lot of news-makers from President Truman and Senator Taft on down. Most of them, of course, appeared in our "Men of Industry" section, which is the metalworking industry's most complete regular chronicle of personnel changes. The truth of that old adage is certainly proved by those pages—readership studies show time after time that the personnel items are among the best read of all of our pages. Used to be that only a few paragraphs scattered through the book covered this sort of information, but across the years the interest has grown so that today's issue carries four full pages of items about people you know in the industry.

Posies for Peninsular

Intriguing is the best word we know for those spreads run in our pages by Peninsular Grinding Wheel Co., latest of which appeared last week and was a "bug killer"—an insect spray made up entirely from grinding wheels. The series has included Christmas trees, clocks, mallets, and other common objects—all made up from photos of grinding wheels. The copy has been skilfully tied in with the art work and the net result has us bug-eyed at the imagination and ingenuity displayed. Let's pass the roses to Peninsular and to the agency—Brooke, Smith, French & Dorrance.

Tuck It in the Tucker

Since the Machine Tool show, which also featured under the same roof a single copy of the new Tucker automobile, there has been much interest in that car. Probably it's because most of the more than 100,000 people at that show hadn't had an opportunity before to inspect the car. At any rate, we heard about one guy who was poking around in the exhibit, lifted the hood, and instead of a motor there was only a suitcase inside. Whereupon he rushed right out and spread rumors to the effect that the whole thing was a big fake. What we'd like to know now is whether or not that suitcase, which was a good-looking one, comes as standard equipment to use up the space vacated when they moved the motor back onto the rear axle. Oops—just happened to think, there isn't any rear axle, either! The most important questions being asked about the new car has nothing to do with the location of the motor, or any other of the mechanical features. It's "How soon can I get one?" Hope the Chicago boys have the answer to that one real quick.

Low Dough, High Food

According to the figures just released by our government, the best place to live in terms of income is Nevada and the least attractive is Mississippi. Out there among the silver mines and the wheels of chance, the average per capita income was $1703 in 1946, while in Mississippi the same average guy only managed to eke out $555. Maybe there's a moral in that somewhere, but at the moment we can't see how you can pay any grocery bills with even the $1703, what with butter at $1.05 per pound and meat being razored off in ounces.

Son of a Minor

We were idling over some accident reports recently, documenting a story on industrial safety, when we suddenly located an item which has had us intrigued ever since. Seems that an employee of a trucking company was killed in an accident, and the claim was filed by his grandmother because his mother was a minor. We are at a loss to figure that one out and still keep the company from violating any child labor laws. That trucker couldn't have been more than eight or nine years old!

Leading Off This Week

There's been a lot of talk about the basing point problems, all of it from steel producers and government sources. STEEL's editors thought maybe somebody should check with the users of steel, and the result is this week's lead—a case study of an important steel consuming industry, telling what the steel buyers think of basing point vs. f.o.b. mill prices.

Shrdlu

(Editorial Index—page 51)

STEEL

Vol. 121—No. 16 October 20, 1947

BUSINESS STAFF

GEORGE O. HAYS
Business Manager

ADVERTISING

R. C. JAENKE
Advertising Manager

C. H. BAILEY
Service Manager

A. V. ANDERSON
Production Manager

New York:
E. W. KREUTZBERG, K. A. ZOLLNER
Pittsburgh:
S. H. JASPER, B. C. SNELL
Chicago:
L. C. PELOTT, V. G. BRETTMAN
Cleveland:
D. C. KIEFER, H. G. ROWLAND
Los Angeles:
F. J. FULLER

•

CIRCULATION AND MARKET RESEARCH

J. W. ZUBER
Director
R. L. HARTFORD
Research Manager
H. E. METZNER
Circulation
R. C. RICE
Readers' Service
G. R. EBERSOLE
Mail & List Service

Field Representatives:
H. R. DUNNE
D. G. HEWITT
G. D. LUKE
C. PETTIGREW
C. A. PRICE

•

MAIN OFFICE

Penton Building, Cleveland 13, Ohio

BRANCH OFFICES

New York 17.....16 East 43rd St.
Chicago 11.....520 North Michigan Ave.
Pittsburgh 19.....2806 Koppers Bldg.
Detroit 2.....6560 Cass Ave.
Washington 4...956 National Press Bldg.
Los Angeles 4.130 N. New Hampshire Ave.
London: 2 Caxton St., Westminster, S.W.1

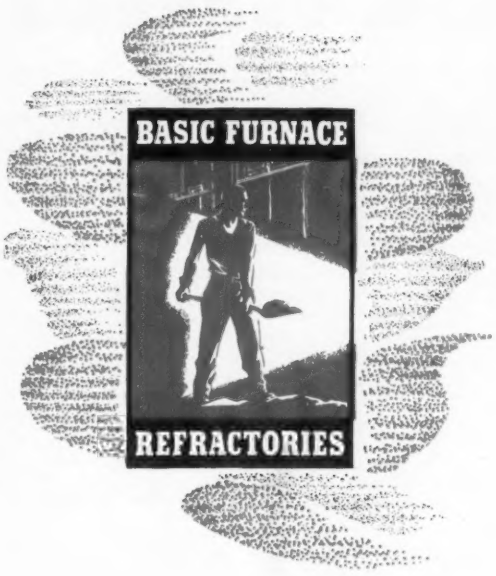
• • •

Published by THE PENTON PUBLISHING Co., Penton Building, Cleveland 13, Ohio, E. L. SHANER, President and Treasurer; G. O. HAYS, Vice President and General Manager; R. C. JAENKE, Vice President; F. G. STEINEBACH, Vice President and Secretary; E. L. WERNER, Assistant Treasurer. Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1947 by the Penton Publishing Co.

Editorial Staff on Contents Page

What's in a name?



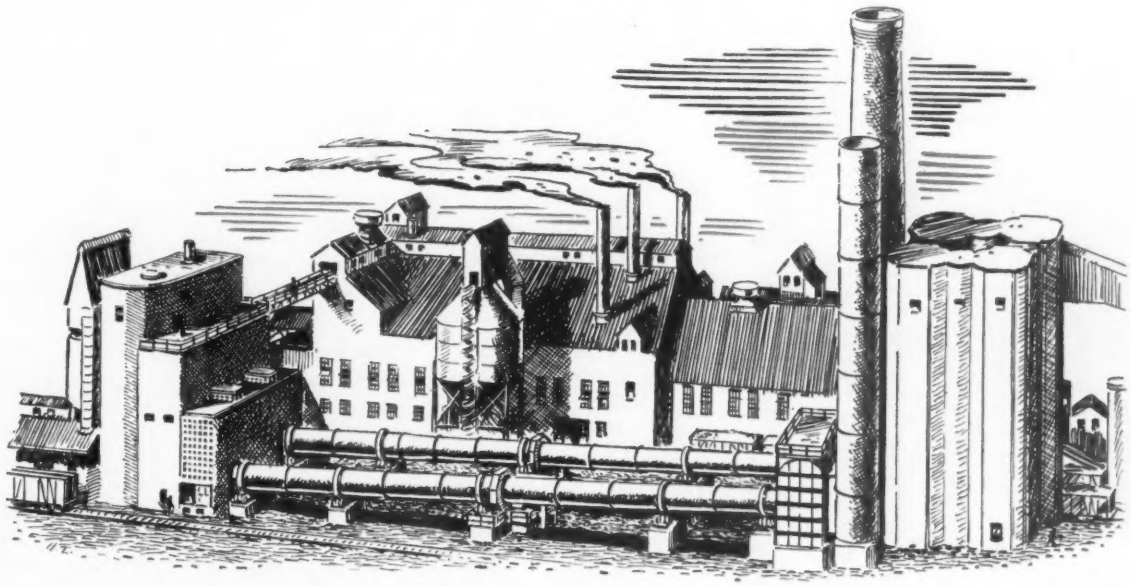
IN the case of Magnefer and Syndolag, the trade names of these well known dead burned dolomite products are backed by the experience of Basic Refractories, Inc. in over 30 years of dolomite refractory production—

—a staff of more than 40 technicians — men and women who are engaged daily in research, development and control in connection with the refractory products of Basic Refractories.

—a record of leadership as evidenced by the introduction of tar sealing, the container car and controlled sizing.

—a modern plant, costing more than $4,000,000 devoted exclusively to the manufacture of basic and neutral refractories and the processing of raw dolomite for refractory, commercial, fluxing and agricultural liming uses.

Magnefer is a ⅜ inch product designed for maintenance of basic open hearth furnaces whereas the sharp rice sized grains of Syndolag make it ideally suitable for fettling electric furnaces.

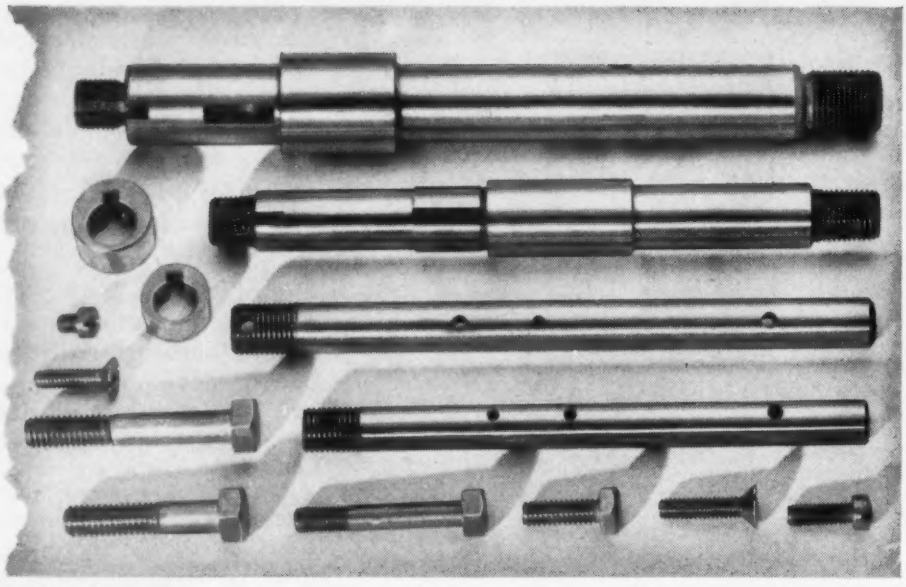


Basic Refractories Incorporated 845 HANNA BUILDING, CLEVELAND 15, OHIO

Exclusive Agents in Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal

REPUBLIC *Enduro* STAINLESS STEEL BARS

These propeller shafts, pump rotors and miscellaneous screws—used in one of the most popular makes of outboard motors —are machined from Republic ENDURO Stainless Steel Bars.



—machine freely... uniformly... smoothly

FREE... THIS HANDY SPEED AND FEED SELECTOR

It's one of the most helpful devices ever offered to operators of automatic screw machines. It gives recommended speeds and feeds on all operations —also gives spindle speeds in surface feet or r. p. m. Write to—

REPUBLIC STEEL CORPORATION
ADVERTISING DIVISION • DEPT. ST
3100 East 45th Street • Cleveland 4, Ohio

● Republic ENDURO Cold Finished Bars are processed by the same operators and to the same high standards of quality for which Union Cold Drawn Steels have been so well known to machine tool users for more than 50 years.

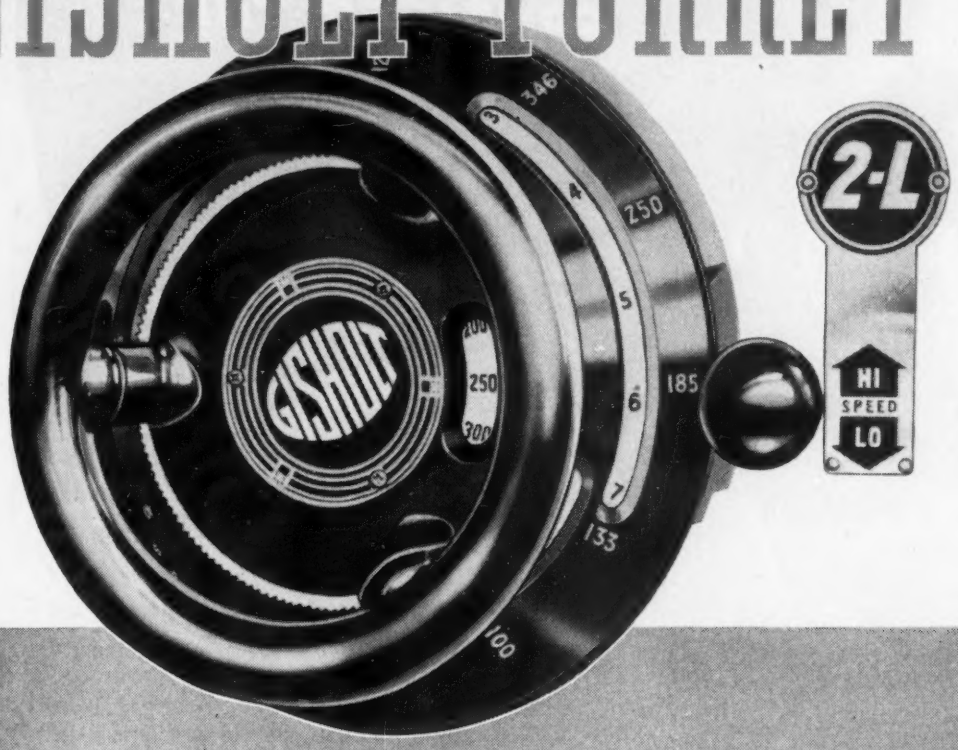
Thus, when you specify ENDURO Bars for your machined parts, you not only are assured of the uniformly high corrosion-resistance and strength of ENDURO—you get sound flaw-free bars, top-notch MACHINABILITY, a high percentage of perfect finished parts, a fine machined surface and low unit cost.

Because of greatly increased facilities—including the most modern equipment—Republic's stainless steel bar capacity is second to none. NOW, you can order Enduro Stainless Steel Bars—cold finished or hot rolled—also wire—and expect PROMPT DELIVERY. Write us.

Republic
REPUBLIC STEEL
ENDURO STAINLESS STEEL
REG. U. S. PAT. OFF.

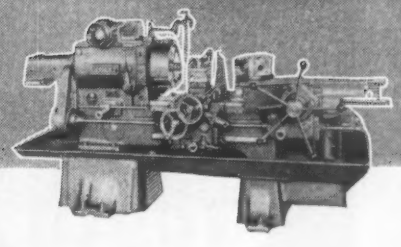
Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

GISHOLT TURRET LATHES



Hydraulic speed selector cuts operator's time as much as 30% —and insures better work

It's power-operated. No manual gear shifting, no needless effort, no waste time between cuts. It increases efficiency on all kinds of turret lathe jobs.



GISHOLT MACHINE COMPANY, *Madison 3, Wisconsin*

... the Gisholt round table represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

turret lathes · balancers · automatic lathes · superfinishers · special machines

CONSIDER THE "Eye-Value" of Tubing IN PRODUCT DESIGN

● Lightness, strength, rigidity, and all the other structural advantages of electric welded tubing are daily becoming better recognized by design engineers. What some are slower to appreciate is the great sales appeal or "eye-value" of tubing.

Typical Example: Furniture manufacturer, using steel tubing mainly for legs of folding tables and chairs. The chair developed side-sway. Two steel rod braces between front and rear legs were replaced with a single tubular brace, curved down at ends and form-fitted over legs. Result: Perfect rigidity, with greatly improved appearance, at no extra cost. This manufacturer has found more and more places for tubing in product design. Significantly, business has increased by leaps and bounds.

Yoder Tube Mills are found wherever electric welded tubing is made. They are universally recognized as the highest development in high-production cold-roll tube forming and welding equipment.

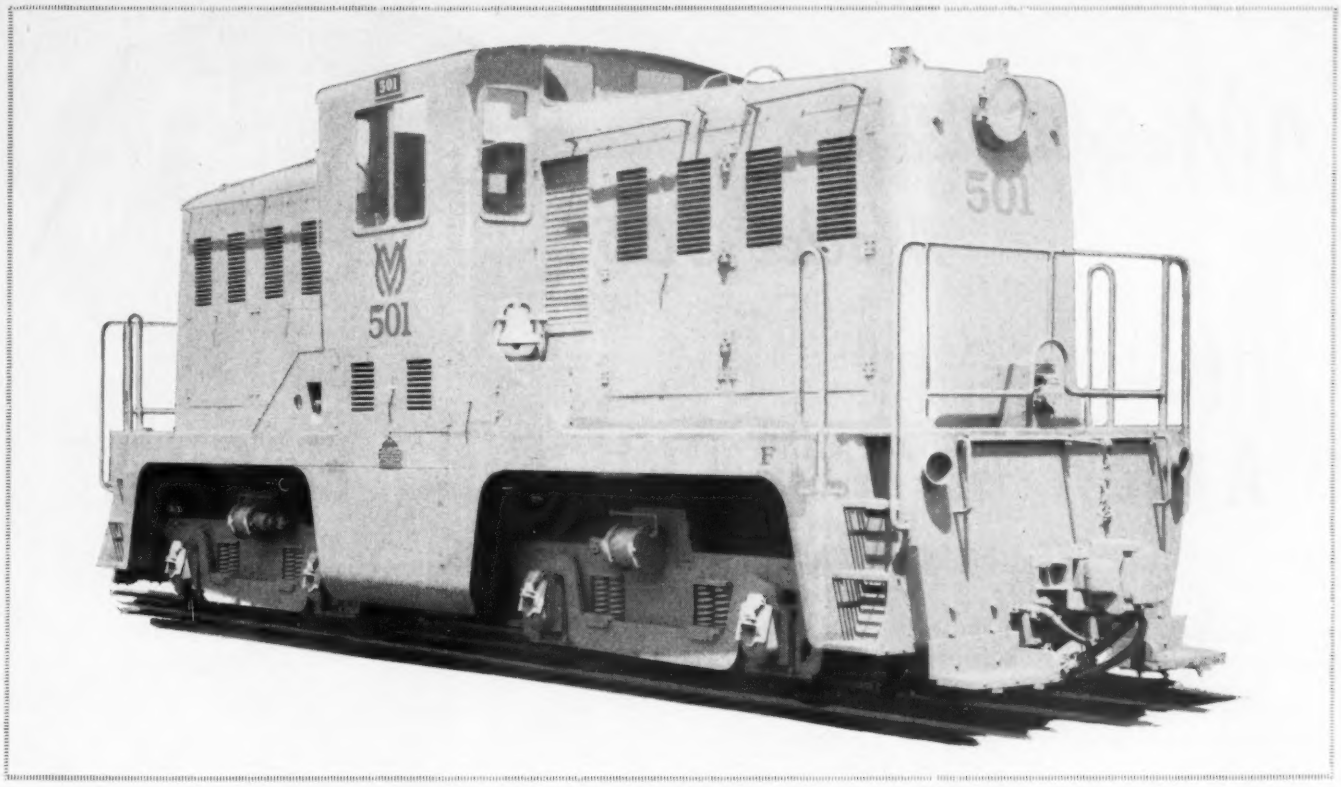
Send for literature containing illustrations and information on equipment for making pipe and tubing.

THE YODER COMPANY
5502 Walworth Ave. • Cleveland 2, Ohio

ENGINEERING YODER MANUFACTURING

ROLL FORMING, TUBE MILL AND SLITTING MACHINERY

36 YEARS' LEADERSHIP • COILING • SLITTING • FORMING • EMBOSSING • CURVING • WELDING • CUTTING-OFF



THE A.B.C.s OF MAKING MONEY WITH WHITCOMB LOCOMOTIVES

Over a period of more than forty years many reports have been received from users of Whitcomb locomotives. This interesting material includes accurate cost figures on operating and maintenance, performance data, hours worked, repair and replacement expense and in general, cost accounting figures pertaining to the operation of locomotives. Comparative figures on operating and maintenance expense between Whitcomb locomotives and the locomotives they replaced were also available. It was found in most instances, savings were made possible because one or more of the following situations existed:

A—Whitcomb locomotives were performing the *same work* in *less time* at *less cost.*

B—Whitcomb locomotives were performing *more work* in the *same time* at *less cost.*

C—Whitcomb locomotives were available *more of the time* at *less cost* for operating and maintenance.

All of which goes to prove that Whitcomb locomotives can and have made important money for their users—they will operate just as profitably for you.

BLW THE BALDWIN GROUP

THE WHITCOMB LOCOMOTIVE CO.

ROCHELLE, ILL.

Subsidiary of THE BALDWIN LOCOMOTIVE WORKS

New Britain
Model 365

does the job twice as fast by working from both ends at once

A NEW TOOL ROTATING DOUBLE END CHUCKING MACHINE

Fast Index, Power Chucking, Steady High Production

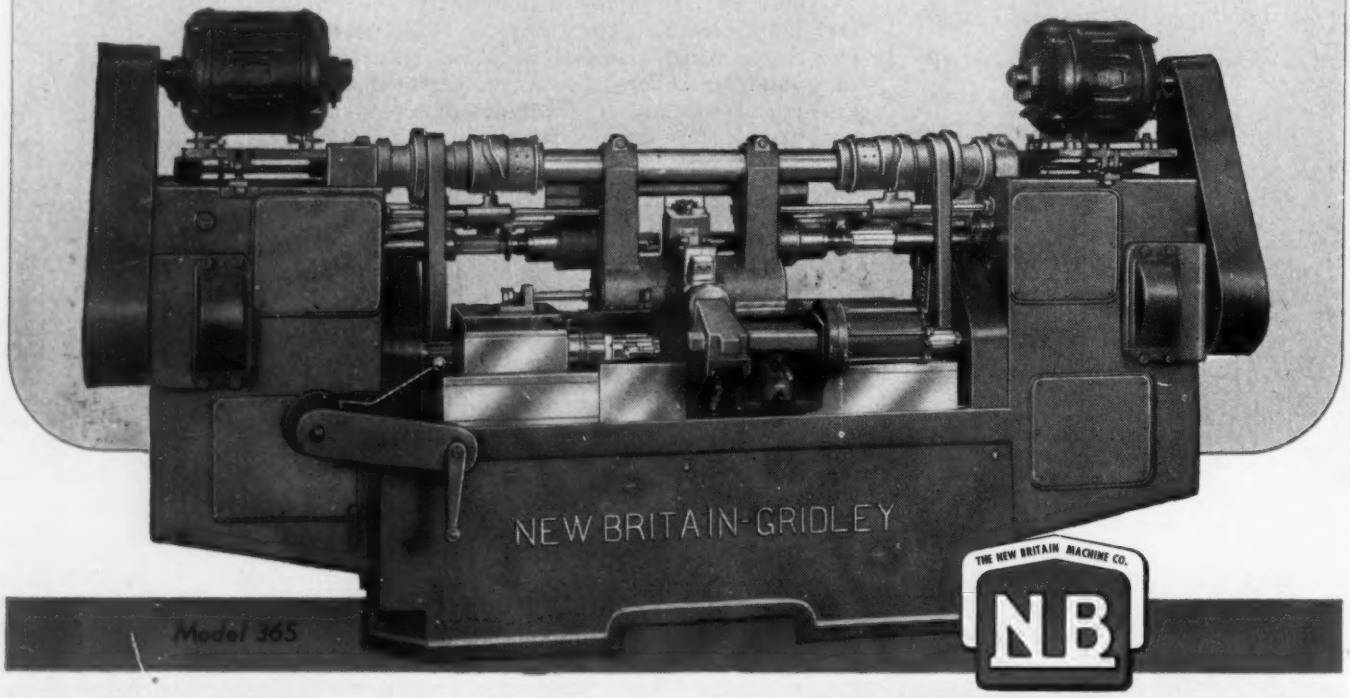
Featuring **1.** A four-chuck horizontal indexing turret with three work spindles on each side. One position for loading. Rough and finish bore, face, drill or ream in the first two positions; finish ream or thread in third position.

2. Over-all weight, power, and rigidity make possible the use of carbide tools and dampen any tendency to vibrate when running at high speed.

3. Anti-friction spindles mounted in positionable quills carried in slides to minimize overhang. Spindle speeds up to 2,000 RPM have been provided for fast machining of non-ferrous metals.

4. Ease of operation. Loading position is waist high. All controls within easy reach of operator. Automatic chucking quickly accomplished. Many types of pieces may be magazine loaded. Until fully inter-locked safety devices are satisfied, turret will not index nor tools jump.

5. High production. Rapid jump and drawback on all feeds. Total idle time of index - 1.67 seconds. Two pieces may be finished at one chucking on some jobs. Geneva motion index and locking mechanism completely enclosed and guarded against dirt and chips. Either lead screw threading or lead cam threading to take full advantage of self-opening dies or collapsing taps available in No. 3 position. Threading spindles may have different speeds and feeds and will reverse within closest limits on each successive cut.

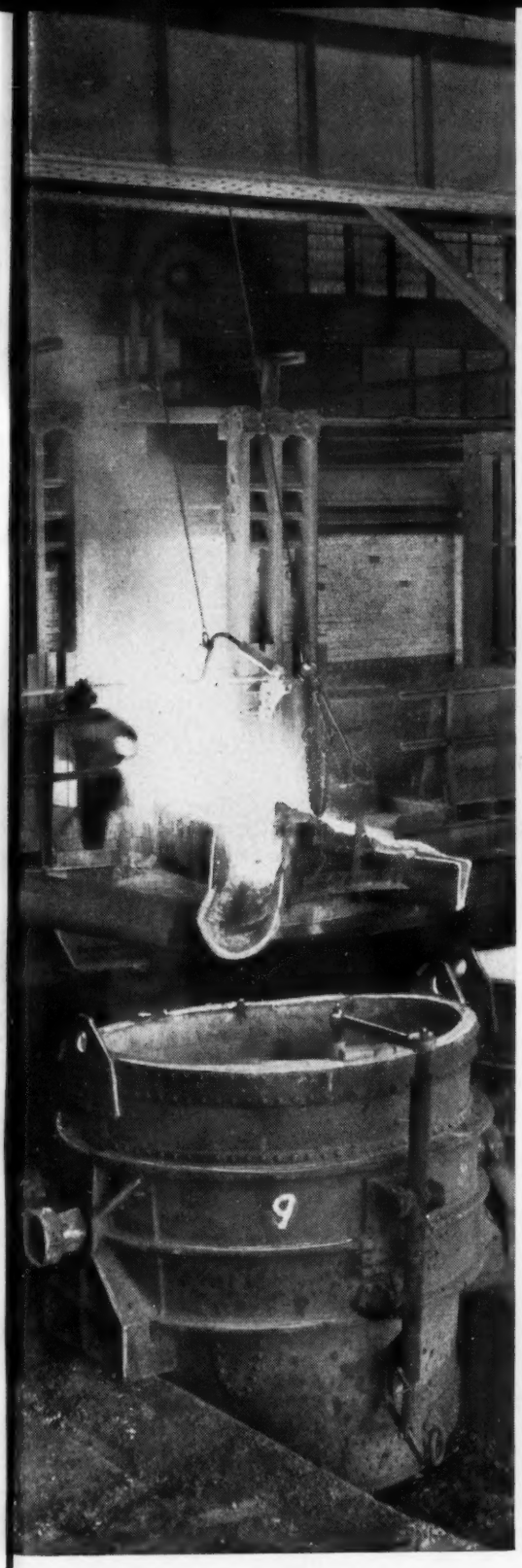


THREE OTHER NEW MACHINES

Latest additions to the New Britain line include: The new, faster more powerful line of automatic screw machines designed to make the most of carbides on long and short runs, a new line of precision cam and air actuated contour turning and boring machines, and a new line of automatic turret lathes.

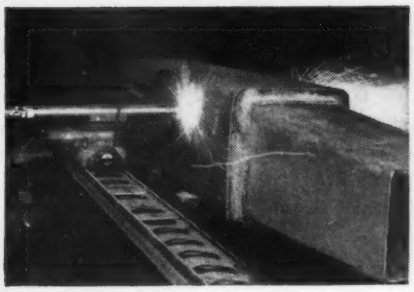
NEW BRITAIN
Automatics
THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN-GRIDLEY MACHINE DIVISION
NEW BRITAIN, CONNECTICUT

N-01063

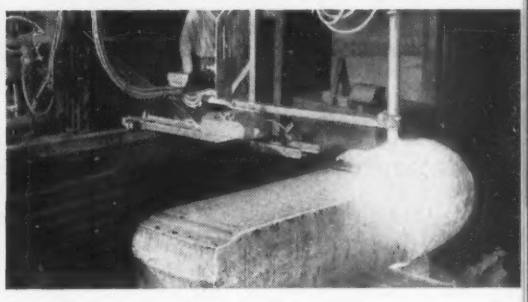


At the blast furnaces and open hearths, oxygen plays an important part. Furnace-tapping with the oxygen lance—oldest use of oxygen-cutting in steel plants—still saves time and reduces hazards.

Help on the Hot and Heavy Jobs



Ingots requiring 200 hours for mechanical "parting" have been split with the OXWELD C-45 heavy-duty blowpipe and then machined in 14 hours total time.



Cutting the hot top off this 26-inch forged slab with the C-45 blowpipe took less than 10 minutes and left the slab end square and undeformed.

The deseaming blowpipe, equipped with the OXWELD starting-rod feed, has reduced conditioning costs more than 50 per cent.

Draining furnace salamanders by oxygen-lance tapping has reduced furnace down-time more than three weeks in some steel plants.

LINDE service engineers who co-operate closely with the steel industry—have combined experience, knowledge, and practical "know-how" to help make better steel, faster, and at lower cost.

LINDE engineering service is always available to LINDE customers through the nearest LINDE office.

Linde

The words "Linde" and "Oxweld" are registered trade-marks of Units of Union Carbide and Carbon Corporation.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

30 East 42nd St., New York 17, N.Y. UCC Offices in Other Principal Cities

In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

The Home of Quality Steel for Middle America

Hundreds of manufacturers recognize the advantage of Granite City's central location in the heart of Middle America. But more than this, they recognize the fine quality of Granite City Steel.

Since 1878, Granite City Steel Company has constantly expanded its facilities to permit the use of the most modern production methods. Yet it has always remained small enough to permit the scrupulous attention to manufacturing detail that results in finer steel.

GRANITE CITY Steel Company

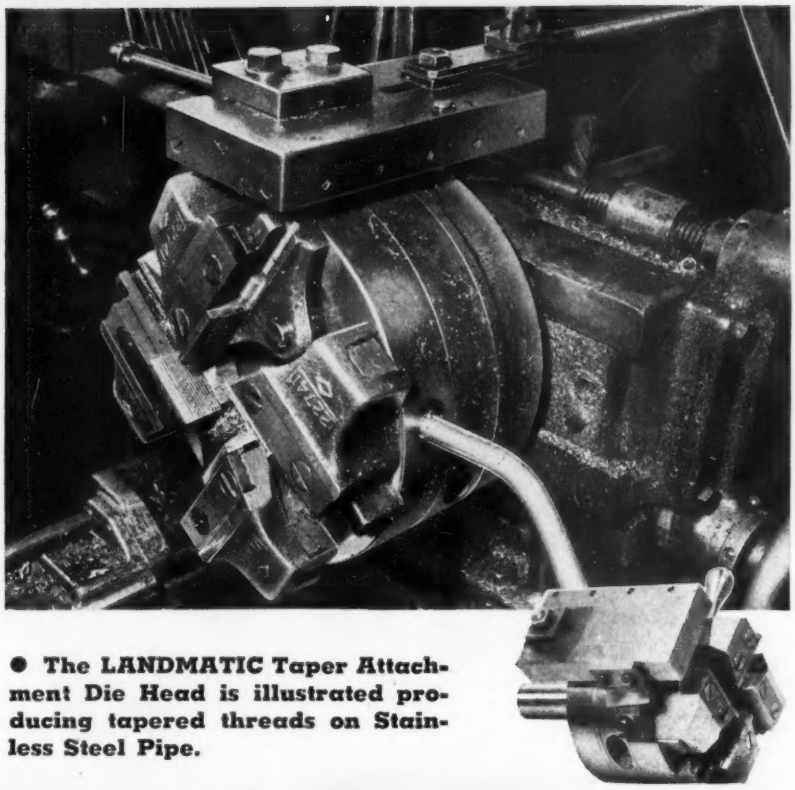
GRANITE CITY, ILLINOIS

STRIPLATES
ELECTRICAL SHEETS
COLD ROLLED SHEETS
HOT ROLLED SHEETS
PORCELAIN ENAMELING SHEETS
STAINLESS-CLAD SHEETS AND PLATES
TIN MILL PRODUCTS
TERNE PLATE
TIN PLATE

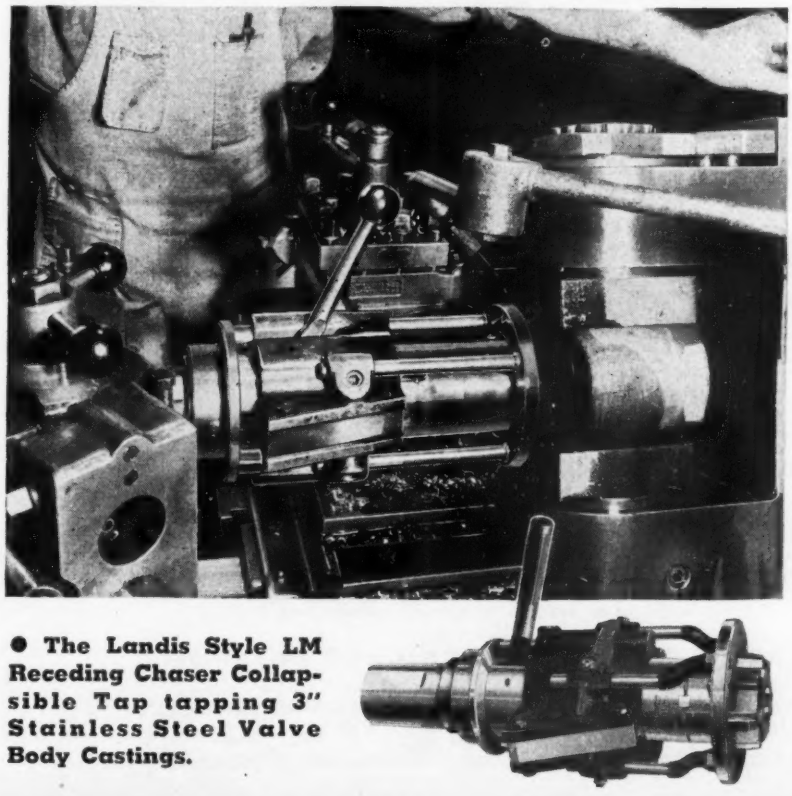
DALLAS
INDIANAPOLIS
KANSAS CITY
MEMPHIS
MINNEAPOLIS
MOLINE
ST. LOUIS
OKLAHOMA CITY

SINCE GRANITE CITY STEEL 1878

For Internal & External *TAPERED THREADS*



● **The LANDMATIC Taper Attachment Die Head is illustrated producing tapered threads on Stainless Steel Pipe.**



● **The Landis Style LM Receding Chaser Collapsible Tap tapping 3" Stainless Steel Valve Body Castings.**

LANDIS

THREADING EQUIPMENT PRODUCES WELL-FORMED AND EXTREMELY ACCURATE THREADED PARTS.

The use of LANDMATIC Taper Attachment Die Heads and LM Receding Chaser Collapsible Taps enables an Eastern manufacturer of Stainless Steel Valves to Thread parts in a highly efficient and satisfactory manner at minimum cost. The cutting action of the chasers used in the dieheads and taps is limited to the throat section by the receding mechanism of the tools. This makes possible the production of threads without chaser "leave-off" marks and assures smooth finished threads as well as long tool life.

Write for Bulletins
F-90—(Taper Attachment Die Head)
G-81—(Receding Chaser Collapsible Tap)

LANDIS REG. U.S. TRADE — MARK PAT. OFF.

LANDIS
MACHINE COMPANY
WAYNESBORO, PA., U.S.A.

THREADING MACHINERY—THREAD CUTTING DIE HEADS—COLLAPSIBLE TAPS

Something like these perhaps?

or these?

or these?

or even these?

Smooth Working-

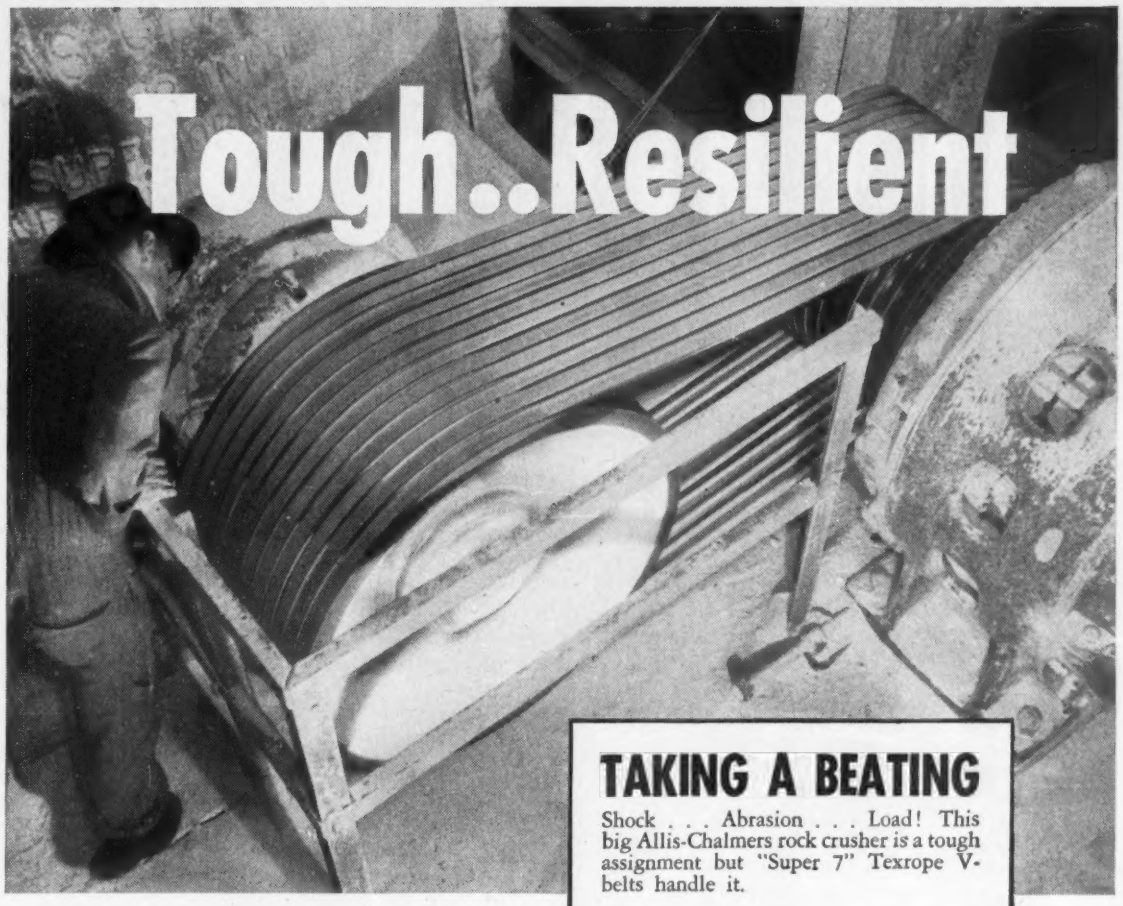
The WILLIAM D. GIBSON COMPANY

DIVISION OF ASSOCIATED SPRING CORPORATION

1800 Clybourn Avenue, CHICAGO 14, Illinois

GIBSON-SPRINGS

Clips • Clamps • Small Stampings • Wire Forms



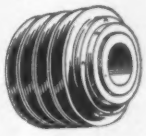
TAKING A BEATING

Shock . . . Abrasion . . . Load! This big Allis-Chalmers rock crusher is a tough assignment but "Super 7" Texrope V-belts handle it.

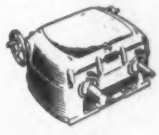
TEXROPE .. Greatest Name in V-Belt Drives

"Super 7" V-BELTS
Five Types — Sizes to suit every power transmission job.

Texsteel, Texdrive, "Magic-Grip"
— sheaves in a full range of sizes, grooves.



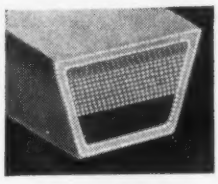
"Vari-Pitch" SHEAVES
Exact variations in speed, stationary or motion control.



SPEED CHANGERS
Speed variations up to 375% at the turn of a crank.

ENGINEERING
Finest V-Belt engineering talent in the world—at your call.

TEXROPE "Super 7" V-Belts result from the cooperative research of two great companies — Allis-Chalmers and B. F. Goodrich. They are sold only by A-C.



. . . You get 7 Great Features in "Super 7" Texrope V-Belts

1. TOUGHER COVER. Two layers of tightly woven long-staple cotton fabric and tough, wear-resistant rubber compound. Protects the belt carcass from grit, moisture and wear — holds its shape — assures maximum belt life.

2. SHOCK ABSORBING. "Super 7" belts combine great strength with the degree of resiliency necessary for long life and smooth power transmission.

3. HEAT RESISTING. *All* "Super 7" V-belts are designed and built to give high resistance to heat.

4. STRONGER CORDS. More cords—imbedded in cool-running rubber compound. A powerful load-carrying structure.

5. PRECISION CURED in pressure molds to assure accurate section and perfect bonding of cords, cover and cushion.

6. ACCURATELY MATCHED. Every belt weighed, measured and carefully inspected before being sized and packed.

7. ENGINEERING LEADERSHIP. "Super 7" Texrope V-belts represent 22 years of research and experience — by Allis-Chalmers, originator of the Multiple V-belt drive.

"Super 7" Texrope V-belts come in five types to meet every operating requirement: *Standard — Heat Resisting — Oil Resisting — Oil Proof* and *Static Resisting*. Call your Allis-Chalmers office or dealer. ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN.

A 2238

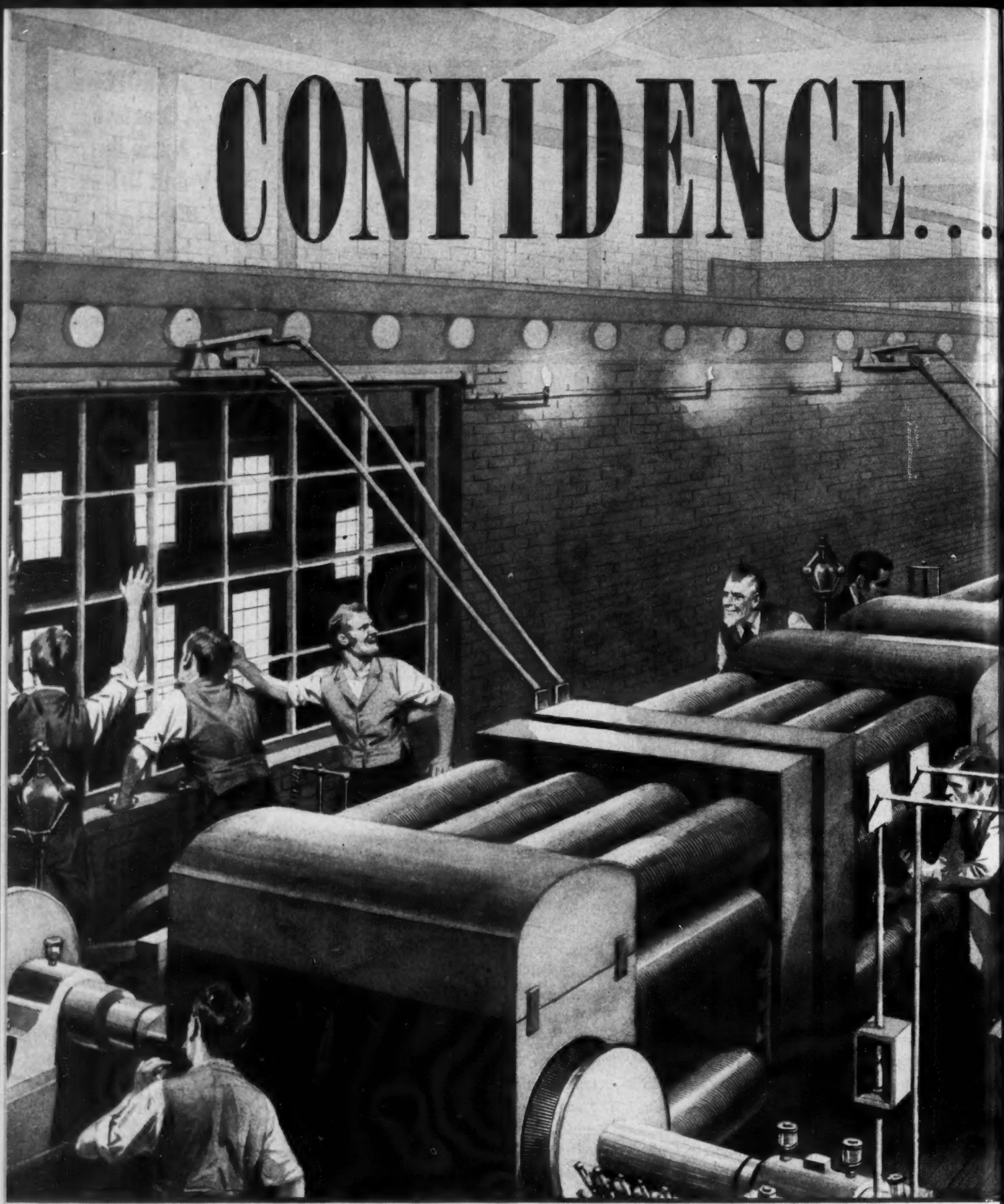
Refer to Sweet's Catalog.

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

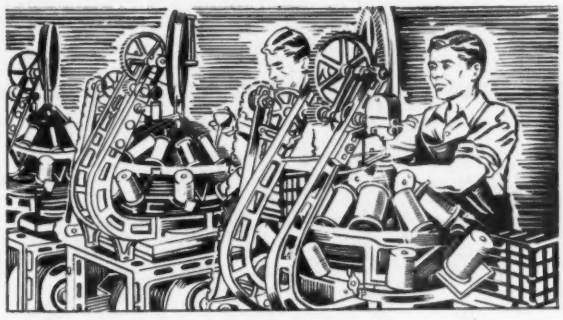
1847 1947
A CENTURY OF SERVICE
to Industry
THAT MADE
America Great

CONFIDENCE....



Manufacturers of Wire Rope and Strand • Fittings • Slings • Screen, Hardware and Industrial Wire Cloth • Aerial Wire Rope Systems
Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Ski Lifts

. . . . . how much is it worth?



IN 1880, when electric lights first were tried on New York's Broadway, Roebling's confidence in the future of electricity motivated a new Roebling undertaking . . . the manufacture of electrical wire and cable.

Roebling's contribution to this great industry during the past sixty-seven years is a matter of record. Its leadership was attained and is being maintained by rigid high standards of quality . . . tireless development of superior products, better processes, and more efficient methods.

Your confidence in Roebling is valued by every Roebling employee. His income depends upon his ability to preserve that confidence. Every Roebling employee knows that you will continue to prefer the output of his hands only if he produces better products and gives you better service.

Your Confidence in Roebling is Roebling's best salesman.

This applies, not only to electrical wire and cable, but to all Roebling products.

HERE IS A FRIEND WHO CAN SAVE YOU TIME AND MONEY!

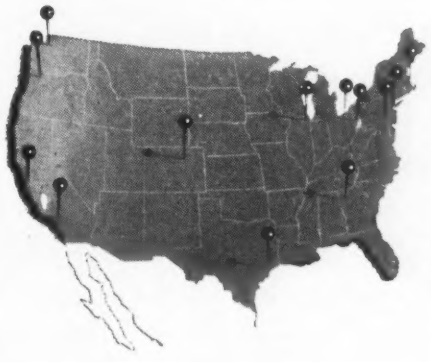
Hundreds of men in your industry have found a cooperative and helpful friend to lend a hand when they are puzzled with a wire problem. He is their Roebling Field Man.

They find that he knows the wire business well, yet never hesitates to call on the Roebling Engineers and the Roebling Development and Testing Laboratory to solve the tough ones.

We, here in Trenton, are constantly being reminded by grateful purchasing and manufacturing men of the ability and integrity of their Roebling Field Man . . . of his honest and successful efforts to prove that the words "Confidence" and "Roebling" are one and the same.

At the right is a convenient listing including your nearest Roebling Branch Office—the home office of your Roebling Field Man. Why not call or write him today? You can make an appointment to meet a friend who can save you both time and money on wire problems.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities



Atlanta	934 Avon Avenue . . . Raymond 2151
Boston	51 Sleeper Street . . . Lib. 4373
Chicago	5525 W. Roosevelt Rd. . . . Crawford 6400
Cleveland	701 St. Clair Ave., N.E. . . . L.D. 249 & Main 5030
Denver	1635 Seventeenth St. . . . East 2684 & Keystone 4111
Houston	6216 Navigation Blvd. . . . Woodcrest 6-8316
Los Angeles	216 S. Alameda St. . . . Trinity 1261
New York	19 Rector Street . . . Wh. 3-5200
Philadelphia	12 S. 12th Street . . . Market 7-2751
Pittsburgh	855 W. North Avenue . . . Fairfax 2766
Portland, Ore.	1032 N. W. 14th Avenue . . . Broadway 5456
San Francisco	1740 17th Street . . . Market 8787
Seattle	900 First Avenue, South . . . Main 4992

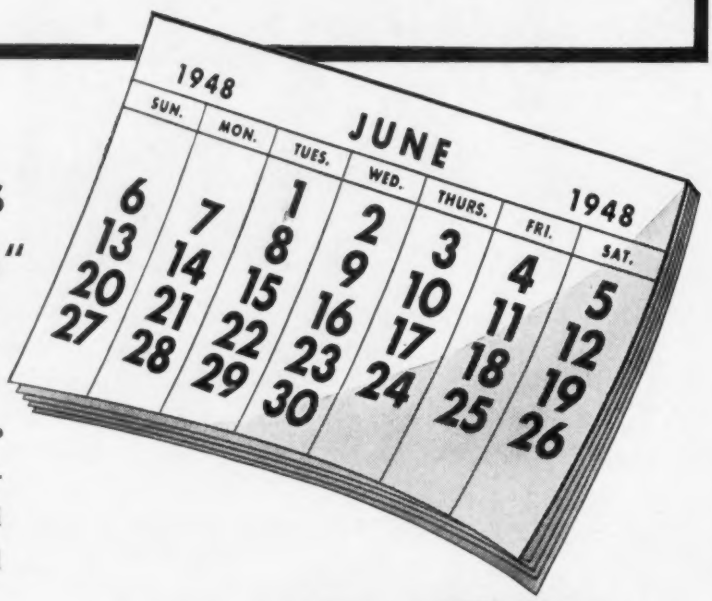
Electrical Wire and Cable • Suspension Bridges and Cables
Aircord, Aircord Terminals and Air Controls • Lawn Mowers

ROEBLING

A CENTURY OF CONFIDENCE

REMEMBER *now* AND PROFIT *later*

DON'T LET HIGH HUMIDITIES "GUM UP THE WORKS" AGAIN NEXT YEAR.

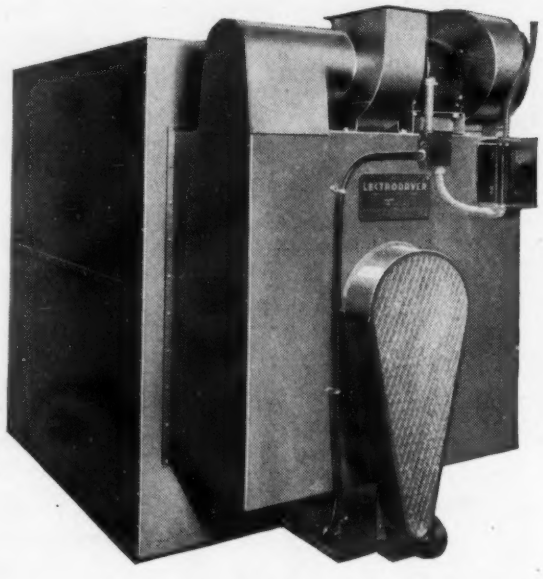


Remember how moisture caused materials to cake up and stall in conveyors . . . when reactions went sour because water contaminated your ingredients . . . when production and quality went down as humidity went up!

Now is the time to start planning to avoid a repetition of those troubles. It'll be too late when next summer's high humidities hit you again. Now is the time to consult Lectrodryer engineers on practical, efficient ways of surrounding your processes with DRY air.

Lectrodryers handle DRYing jobs in small and large volumes, at low and high pressures —air, gases and organic liquids. Tell us your problem and we'll recommend the standard or special machines best suited to the task. Write Pittsburgh Lectrodryer Corporation, 323 32nd Street, Pittsburgh 30, Pennsylvania.

In England: Birlec, Limited, Tyburn Road, Erdington, Birmingham.
In Australia: Birlec, Limited, 51 Parramatta Road, Glebe, Sidney.



No ups and downs of humidity with an air-drying Lectrodryer.

LECTRODRYERS DRY WITH ACTIVATED ALUMINAS

LECTRODRYER

REGISTERED TRADEMARK U.S. PAT. OFF.

PROTECTION

WHERE NEEDED

H-722 . . . Men's Russet Glove, Lace-to-Toe Blucher. Compositior Cord sole, rubber hee! Widths C-D-E, sizes to 13

...Insure Workers Feet In Sure Protection with HY-TEST Safety Shoes

Each worker is his own goalie when the puck of fate, ACCIDENT, heads his way. And it's protection well placed when he's wearing Hy-Test Safety Shoes. The built-in *Anchor-Flange** Steel Box Toe stops accidents in their tracks...prevents many painful, costly injuries. All leather in vital parts, Hy-Test Safety Shoes wear longer. They're more comfortable... keep feet feeling fresher while keeping toes safer. Sizes are 5 to 15 in widths AA to EEE.

HY-TEST SAFETY SHOES

*ANCHOR FLANGE STEEL BOX TOE

This flange adds extra strength to the steel arch's sidewall. Anchored between insole and outsole, it also serves to resist shifting, tilting, and cutting through outsole under impact.

HY-TEST Safety Shoes

THE WORLD'S LARGEST SELLING SAFETY SHOE

HY-TEST DIVISION • INTERNATIONAL SHOE COMPANY • ST. LOUIS 3, MISSOURI • EASTERN OFFICE • MANCHESTER, N. H.

Hanson-Van Winkle-Munning Company

Announces the

PR

PLATING PROCESS

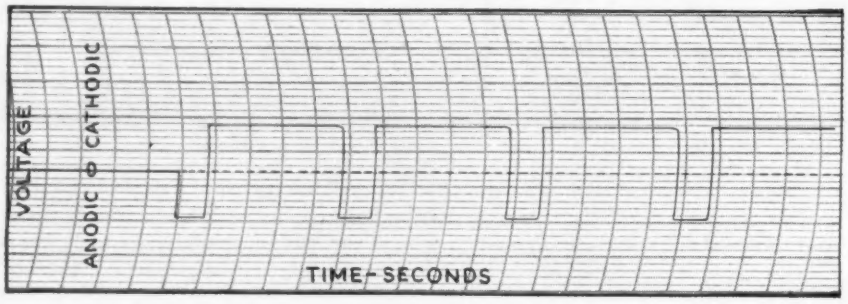
(The Periodic Reverse Current Electroplating Process)

The PR Plating Process, an engineering development of the Westinghouse Electric Corporation, involves plating in the conventional fashion for a given length of time, followed by current reversal for a short period. Repetition of this cycle provides the following advantages:

Typical Electronic Timer-Contactor Unit which effects current reversal at the plating tank.

1. Increased rate of plating
2. Improved surface brightness
3. Increased density of deposited metal
4. Improved metal distribution
5. Increased smoothness of deposit
6. Decreased porosity
7. Better corrosion protection
8. A method for obtaining heavier deposits

Characteristic Voltage-Time Cycle for H-V W-M PR Controller. Sample curve shows starting line at zero voltage. Short cycle is anodic; long cycle is cathodic.



Licensing Agreements now available for issuance. Write:

3639

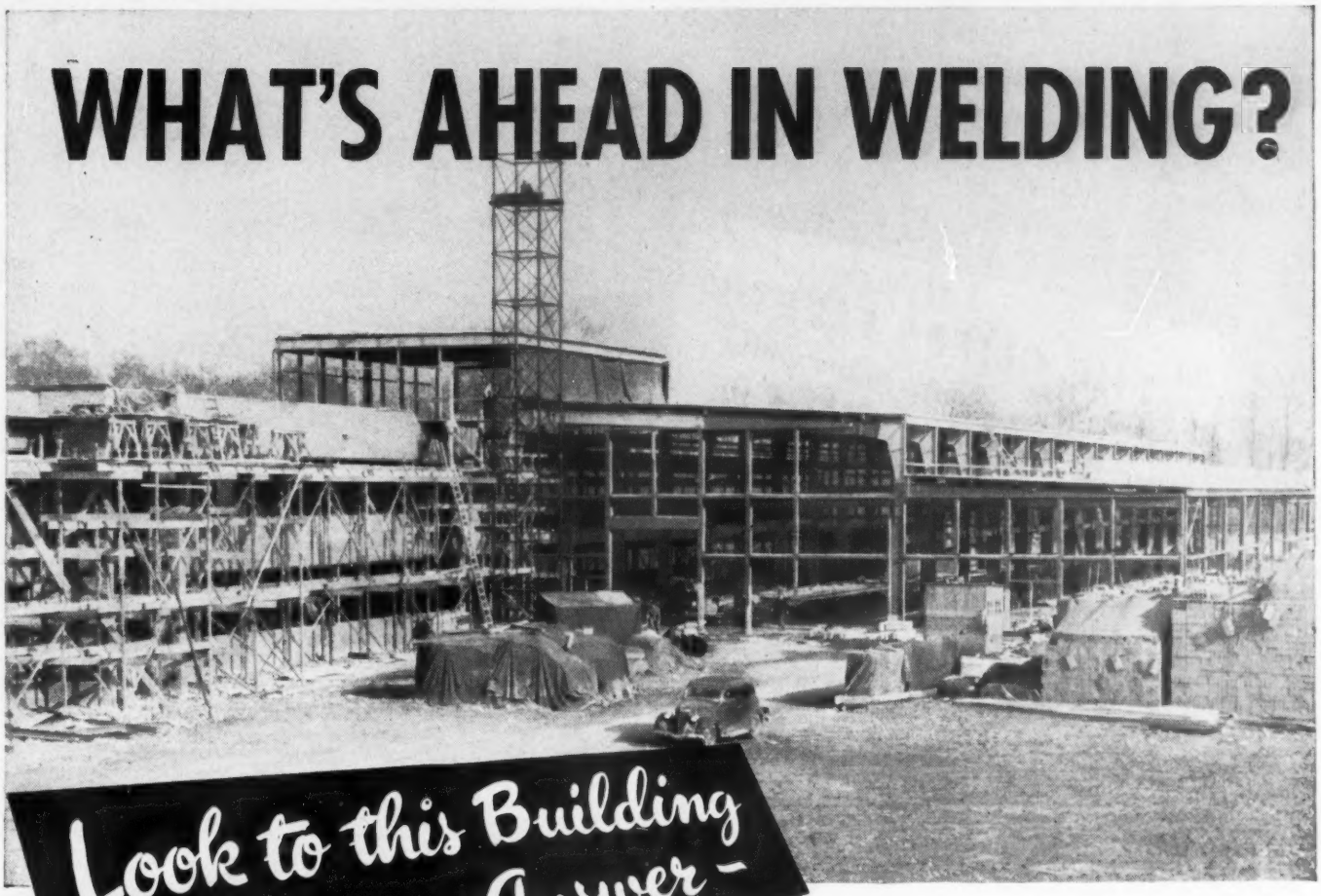
HANSON-VAN WINKLE-MUNNING COMPANY
MATAWAN, NEW JERSEY

PLANTS: MATAWAN, NEW JERSEY · ANDERSON, INDIANA

SALES OFFICES: ANDERSON · CHICAGO · CLEVELAND · DAYTON · DETROIT · GRAND RAPIDS
MATAWAN · MILWAUKEE · NEW HAVEN · NEW YORK · PHILADELPHIA · PITTSBURGH · ROCHESTER
SPRINGFIELD (MASS.) · STRATFORD (CONN.) · SYRACUSE

HANSON-VAN WINKLE-MUNNING CO. · MATAWAN, NEW JERSEY, U.S.A. · SINCE 1820

WHAT'S AHEAD IN WELDING?



This is the unusual new laboratory of the Air Reduction Sales Co., at New Providence, N. J., dedicated to research in and development of new welding processes and equipment.

The structure, erected with Ingalls fabricated steel by the Ingalls Iron Works Co., features all-welded steel frames, reinforced concrete foundations and floors, and brick walls with continuous steel-sash windows.

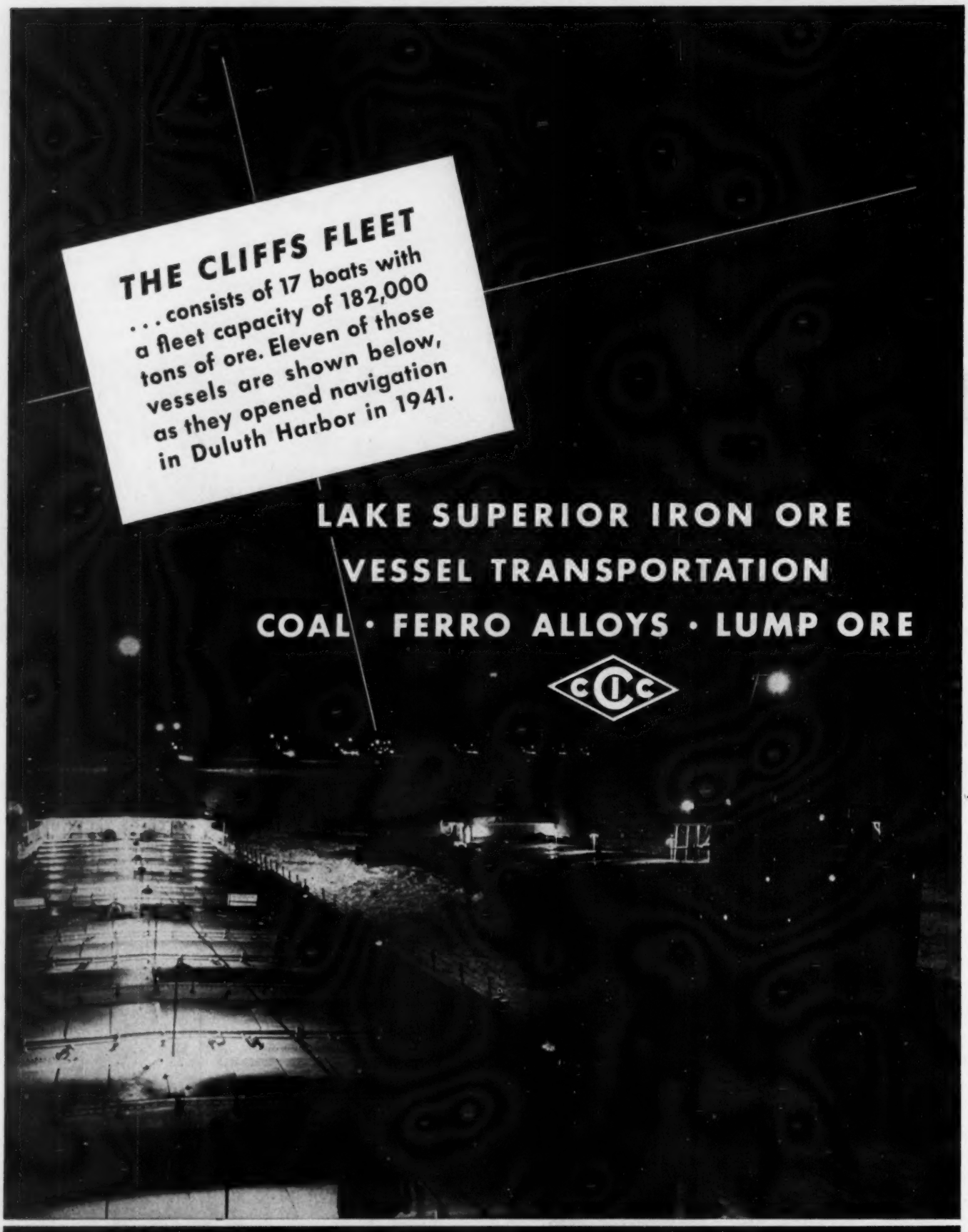
Principal interior features are welded pipe lines for industrial gases, specially constructed rooms for experiments, and movable steel partitions for maximum flexibility of interior working space.

WHAT'S AHEAD FOR YOU?

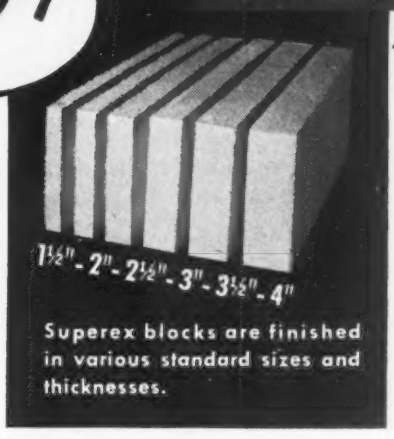
If you have a structural problem, dependable Ingalls fabricated steel may help solve it. Ingalls steel is highly economical, comes ready to erect in exact accordance with specifications. Let us quote on your structural steel needs. whether large or small.

INGALLS
STEEL

THE INGALLS IRON WORKS CO., THE INGALLS SHIPBUILDING CORP., The Steel Construction Co., Birmingham Tank Co. Offices at BIRMINGHAM, Pittsburgh, New York and New Orleans. Shipyards at Pascagoula, Miss., and Decatur, Ala. Fabricating plants at Birmingham and Pittsburgh


THE CLIFFS FLEET
. . . consists of 17 boats with a fleet capacity of 182,000 tons of ore. Eleven of those vessels are shown below, as they opened navigation in Duluth Harbor in 1941.
LAKE SUPERIOR IRON ORE
VESSEL TRANSPORTATION
COAL · FERRO ALLOYS · LUMP ORE
CCC
The Cleveland-Cliffs Iron Company
UNION COMMERCE BUILDING · CLEVELAND 14, OHIO

YES, for over 20 YEARS SUPEREX has never been surpassed



Superex blocks are finished in various standard sizes and thicknesses.

SUPEREX is industry's leading block insulation . . . in hot blast stoves, mains, bustle pipes, kilns, regenerators, roasters, high temperature mains, flues, stacks, industrial and metallurgical furnaces, stationary and marine boilers and auxiliary power plant equipment—wherever the insulation must withstand temperatures up to 1900 F behind a refractory lining.

These seven reasons will tell you why:

1. Low Thermal Conductivity—Superex is made from specially selected calcined diatomaceous silica, bonded with asbestos fibre—presenting a formidable barrier to the passage of heat.

2. High Heat Resistance—J-M Superex Blocks safely withstand temperatures up to 1900 F without deterioration.

3. Light Weight—Approximately 24 lbs. per cu. ft.

4. High Physical Strength—Withstands vibration and other physical abuse encountered in normal service. Approximately five tons pressure per square foot are required to compress Superex ⅛ inch.

5. Permanent Efficiency—Superex maintains high thermal efficiency indefinitely—will not disintegrate in service for which recommended.

6. Quick Application—The convenient sizes and light weight of Superex assure fast, economical installations.

7. Easy Cutting and Fitting—Superex is easily cut with an ordinary knife or saw for fitting around openings or irregular surfaces.

Special shapes and curved blocks—in addition to the 6 standard thicknesses illustrated—can be supplied. Write Johns-Manville, Box 290, New York 16, N. Y.

JM PRODUCT

JOHNS-MANVILLE *First in* INSULATIONS

We're Delivering *Lighter* Gauge STAINLESS STEEL SHEETS

To your specifications when you want it.

The Washington Steel Corporation is able to supply fabricators with a constant flow of *MicroRold* Stainless Steel Sheets, Type 302 or 304 in a range from 24 to 30 gauge by 36 inches wide by any length.

Many fabricators have specified certain gauges which may be heavier than is actually needed. Now, because of improved cold rolling mill equipment, manufacturers may specify *MicroRold* cold rolled sheet in the actual gauge required for a specific job and be assured of getting a product with no crown and held to a tolerance of plus or minus .001" of the specification. The "no crown" feature of *MicroRold* Stainless Steel and overall accuracy of gauge means economies as more area or parts per ton of material is realized.*

From regular users now polishing their sheets, we are told that output per turn is often more than doubled.

If we can be of service or if further information is needed, we hope you will call one of Washington Steel's representatives or direct your inquiry to the mill.

***Example of 21% saving**

.012" × 36" × 96" = 24 sq. ft. = 12# @ 62.25¢ lb. = $7.47 = 31.00¢ sq. ft.
.024" × 36" × 96" = 24 sq. ft. = 24# @ 39.50¢ lb. = $9.38 = 39.50¢ sq. ft.

MicroRold STAINLESS STEEL MEANS

Remarkable Accuracy of Gauge
More Area or Parts per ton
Consistant Physical Properties
More Dense Surface Structure
Easier and Less Expensive to Polish

WASHINGTON STEEL CORPORATION

WASHINGTON, PENNSYLVANIA

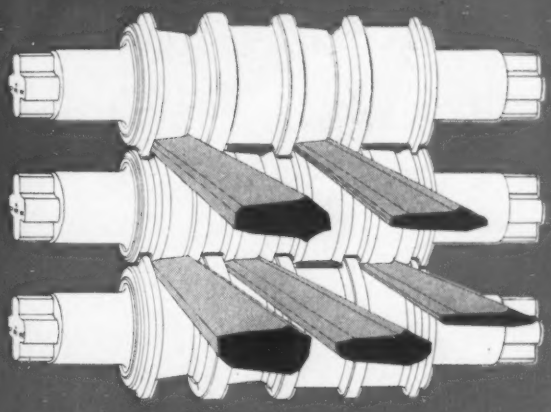
Broad Street Station Bldg.
Philadelphia 3, Pa.

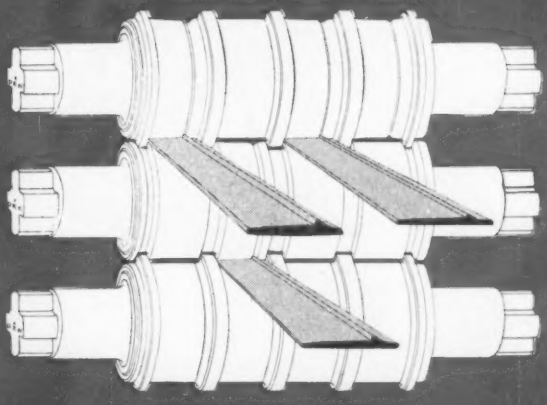
2565 Guardian Bldg.
Detroit 26, Mich.

1 North LaSalle Street
Chicago 2, Ill.

ROLLING TECHNIQUE . . .

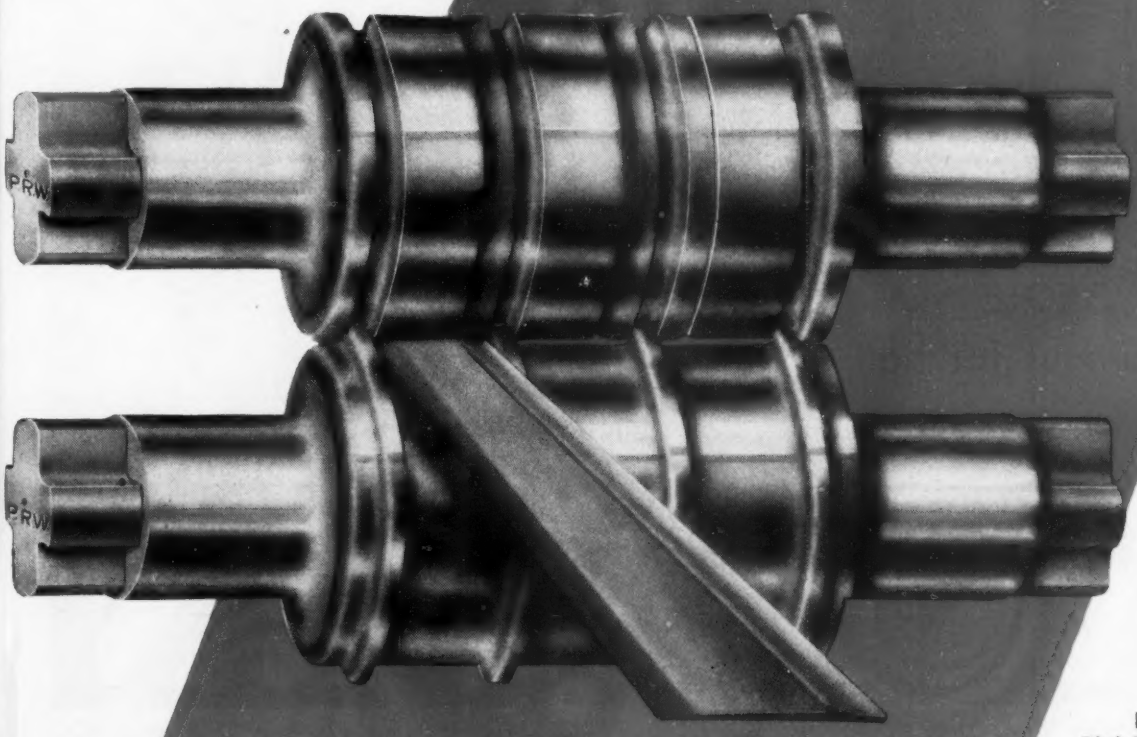
Tie Plate





A small piece of steel between the railroad rail and each cross tie might seem unimportant to the average person, but without it heavy or high speed trains could not operate. Cost of track maintenance without these tie plates would be prohibitive. Proper rolls play a large part in producing high tonnage of quality bar to meet present day rigid specifications.

Pittsburgh Rolls, with over three-quarters of a century of roll-making experience and satisfactory performance behind them, can be relied upon to deliver the production of highest quality for which high speed modern mills are designed, at *less cost cost per ton of steel rolled.*



PITTSBURGH ROLLS
Division of Blaw-Knox Company
PITTSBURGH, PA.

PITTSBURGH ROLLS

Increase the dependability of your springs with the uniform quality and precision standards of EAGLE Music Wire . . . Famous for half a century.

WASHBURN

WASHBURN WIRE COMPANY, NEW YORK CITY
CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

NEW

Electropolishing solution for brightening stainless steel

by Du Pont

OUTSTANDING ADVANTAGES:

1. **PRE-MIXED**—ready for immediate use; contains correct proportion of ingredients for most effective performance.
2. **REMAINS LIQUID**—does not freeze or solidify at room temperatures; reaction products form sludge which is easily removed.
3. **ONE SOLUTION**—for original installation, maintenance and replenishment.
4. **WIDE OPERATING RANGE**—more efficient at higher or lower current density than other solutions.
5. **EASY CONTROL**—can be maintained at peak effectiveness by non-technical personnel.
6. **ECONOMICAL**—long life; solution need not be discarded due to slime formations.
7. **NON-TOXIC**—no harmful fumes, no noxious odor.
8. **NON-EXPLOSIVE**—no risk of vapor ignition, violent chemical reaction, or detonation.

Extensive tests in both large and small installations prove that this new and better Electropolishing Solution has many unusual and outstanding advantages. Developed for the polishing of chromium-nickel types of stainless steel, it may be used on chromium alloys as well.

For further information and prices, write or call our nearest district office. E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Dept., Wilmington 98, Delaware.

DISTRICT OFFICES: Baltimore, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, El Monte, Calif., New York, Philadelphia, Pittsburgh, San Francisco.

DU PONT ELECTROCHEMICALS

BETTER THINGS FOR BETTER LIVING
. . THROUGH CHEMISTRY

DU PONT
REG. U. S. PAT. OFF.

NON-FLUID OIL

TRADE MARK REGISTERED

STAYS

ALIVE

L-O-N-G-E-R

TESTS prove that NON-FLUID OIL stays "alive" longer than lubricating greases when used on ball and roller bearings. This is due to the unique process by which NON-FLUID OIL is made, and through which it acquires greater stability and higher protective properties than can possibly be afforded by grease lubrication. Even greases which do not dry out or harden after a period of time, actually become "dead" and have little lubricating qualities.

We invite you to send for testing samples which will prove our claim that NON-FLUID OIL stays "alive" l-o-n-g-e-r, outlasting ordinary lubricants 3 to 5 times.

WAREHOUSES:
Charlotte, N. C. • Greenville, S. C. • Atlanta, Ga.
Providence, R. I. • Detroit, Mich. • Chicago, Ill.
St. Louis, Mo.

WORKS:
Newark, N. J.

N. Y. & N. J. Lubricant Co., Dept. S
292 Madison Avenue, New York 17, N. Y.

Please send testing sample of NON-FLUID OIL to be used in the following machinery:

.....

.....

Name .....

Company .....

Street .....

City ..... State.....

NEW YORK & NEW JERSEY LUBRICANT CO.

292 MADISON AVENUE, NEW YORK 17, N.Y.

"400 different types to choose from"

MEANS WE CAN SUPPLY THE RIGHT WIRE FOR YOUR NEEDS

ROUND wire, flat wire, square wire, hexagon wire. Soft wire, hard wire, tempered wire. Wire as thin and flexible as a human hair, wire that has the strength of a crowbar. Whatever kind of wire you need to make your product, come to wire headquarters for it. We make more than 400 different types of U·S·S American Manufacturers Wire. And our customers use these wires for more than 160,000 different manufacturing uses!

You will find American Manufacturers Wire always uniform, always true to specification, which means easier, more uniform fabrication for you. And if your need is a *special* need, our staff of wire specialists will gladly consult with you about the development of a new wire that will be just exactly right to do your job best.

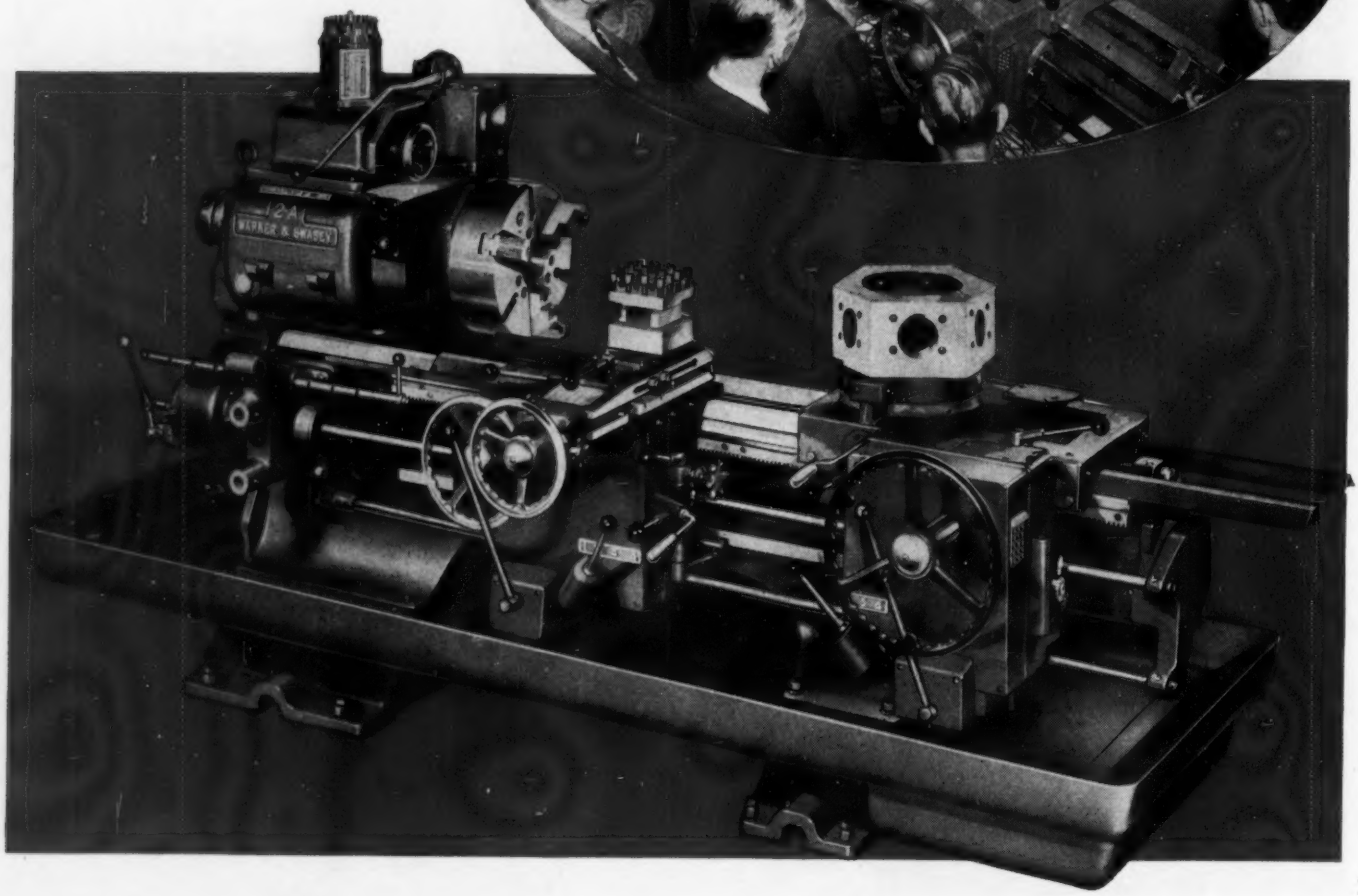
AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
Tennessee Coal, Iron & Railroad Company, Birmingham,
Southern Distributors
United States Steel Export Company, New York
UNITED STATES STEEL

USS AMERICAN MANUFACTURERS WIRE UNITED STATES STEEL

U·S·S AMERICAN MANUFACTURERS WIRE

Important New

Demonstrated for the first time at the Machine Tool Show, these new improvements were of keen interest to production men whose operations call for heavy-duty metal turning.



You can machine it better, faster, for less ... with a Warner & Swasey

TURRET LATHES, SINGLE AND MULTIPLE SPINDLE AUTOMATICS,

Features Added to

Warner & Swasey Heavy-Duty Saddle Type Turret Lathes

★ **INDUCTION HARDENED BEDWAYS** for greatest wear resistance; INTEGRALLY CAST with headstock for maximum rigidity. In addition, Warner & Swasey's proven TELESCOPING WAY COVER DESIGN is maintained for extra protection against abrasive matter or accidental damage as well as the washing away of lubricant.

★ **NEW CROSS SLIDE APRON DESIGN** carries a single, convenient lever that provides 4-way rapid traverse of the cross slide . . . longitudinal and transverse. "Feather-touch" lever control shifts power operated clutch for instant positioning with minimum manual effort.

★ **NEW LOCATING AND LOCKING MECHANISM** for fixed center hexagon turrets. Single lever accurately locates and rigidly locks the turret. Double anti-friction taper bearings on the center stud permits easy indexing even with unbalanced tooling. Indexes to .0005".

★ **NEW GEAR BOX DRIVE** operates rapid traverse mechanism, coolant and lubricating pumps. Powered by V-belt drive or individual motor.

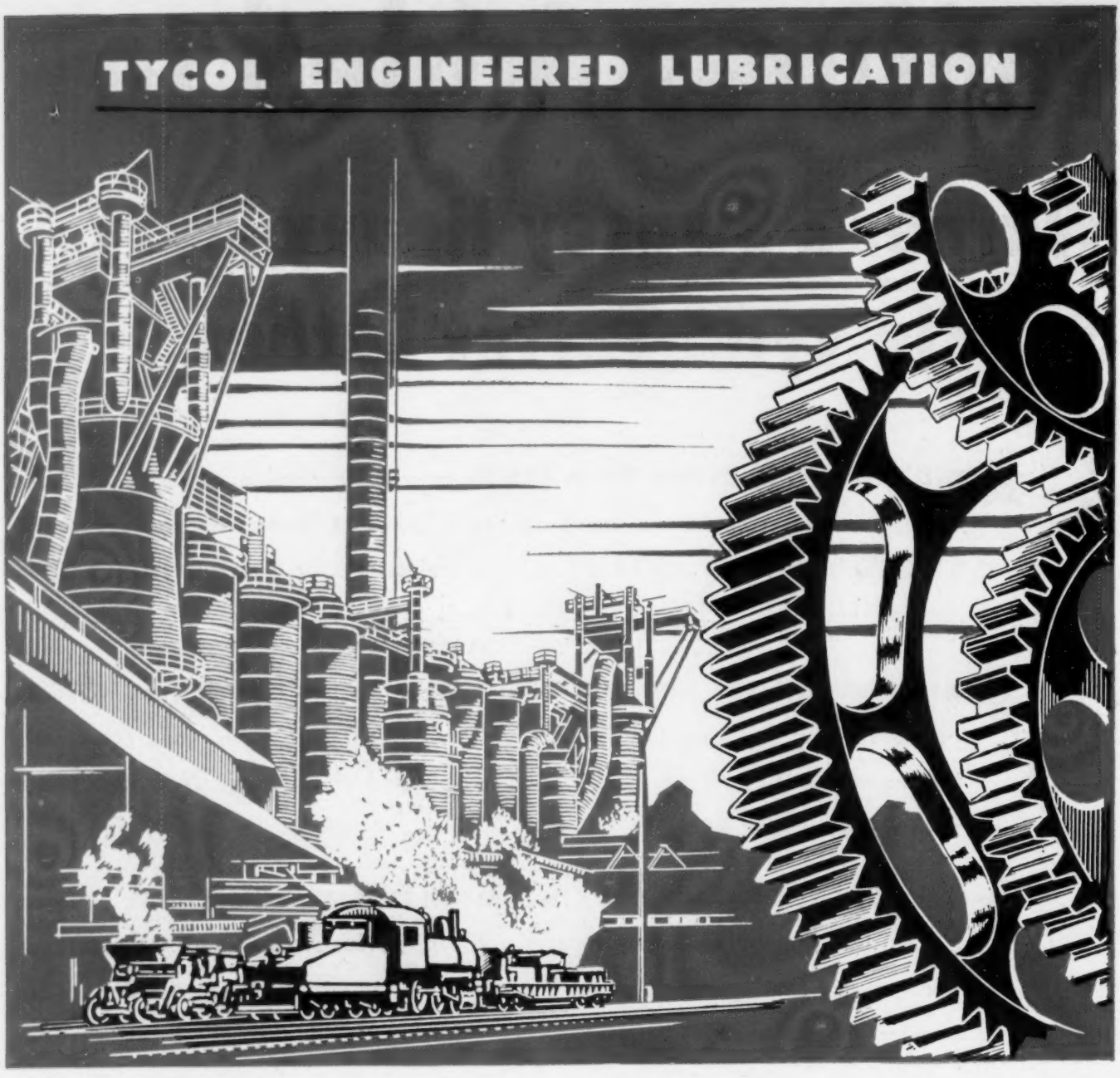
★ **POSITIVE AUTOMATIC LUBRICATION** for carriage and saddle.

For information on the many new developments introduced in the Warner & Swasey line of machine tools and accessories, call in your Warner & Swasey field representative or write . . .

WARNER & SWASEY
Machine Tools
Cleveland

PRECISION TAPPING AND THREADING MACHINES

TYCOL ENGINEERED LUBRICATION



cuts "down time" . . . increases production

TYCOL
INDUSTRIAL LUBRICANTS

**Boston • Charlotte, N. C.
Chicago • Detroit
Pittsburgh • Philadelphia
Tulsa**

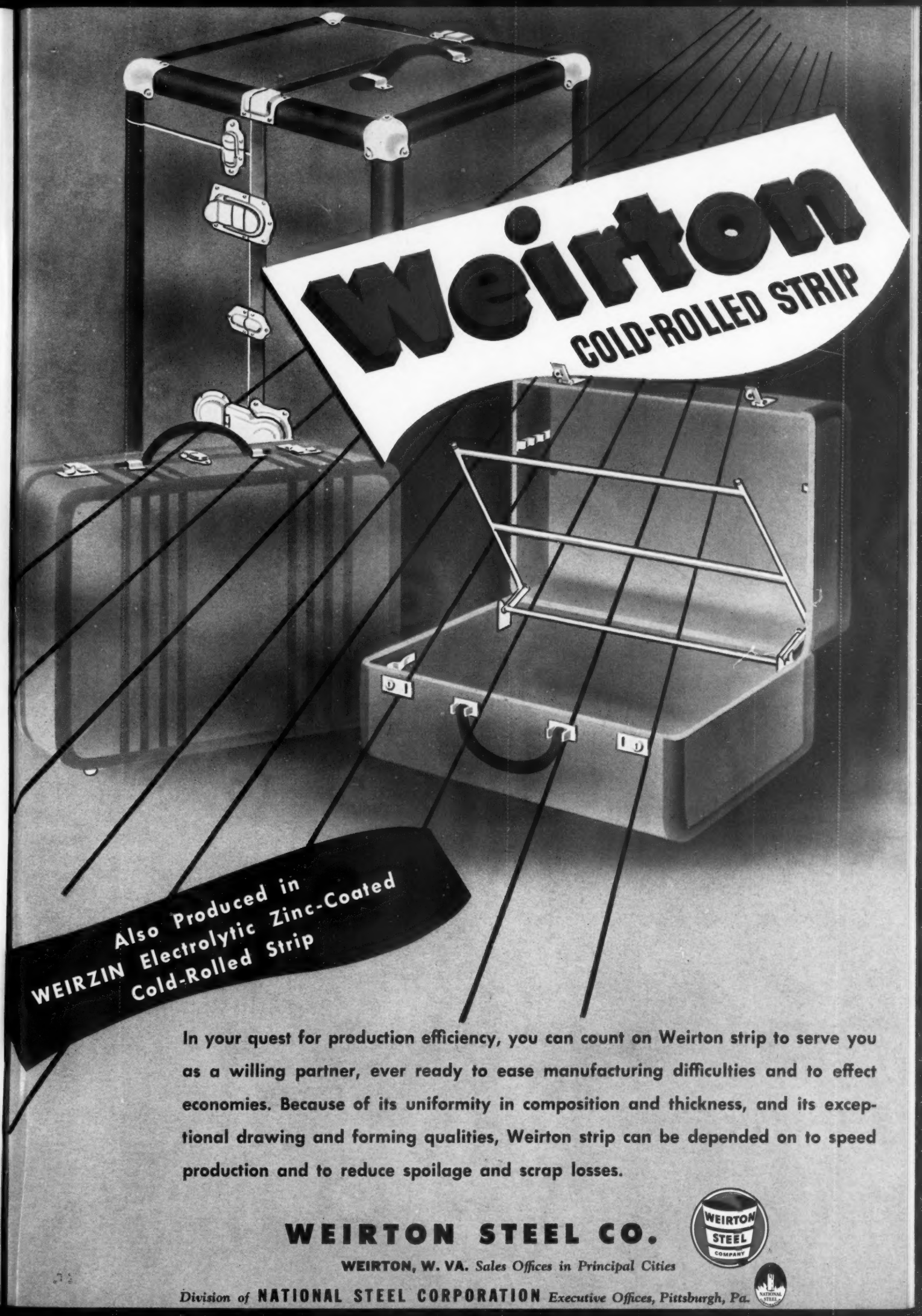
TIDE WATER ASSOCIATED OIL COMPANY
17 BATTERY PLACE - NEW YORK 4, N. Y.

Under all conditions the proved performance of Tycol lubricants more than meets their recommended service.

Rigidly controlled and tested during manufacture, Tycol oils and greases retain their uniformity within each classification — from the first drain to the last. This unvarying high quality accounts for Tycol's wide acceptance among operators interested in cutting down time . . . top efficiency . . . increased production.

Whatever your lubrication need, there's a Tycol oil or grease *scientifically engineered* to afford greater economy . . . longer machine life for every piece, and type of equipment. Let Tide Water Associated help you select the best lubricant for your particular need. Write your nearest Tide Water Associated Office for full details.

LUBRICATION—"ENGINEERED TO FIT THE JOB"



In your quest for production efficiency, you can count on Weirton strip to serve you as a willing partner, ever ready to ease manufacturing difficulties and to effect economies. Because of its uniformity in composition and thickness, and its exceptional drawing and forming qualities, Weirton strip can be depended on to speed production and to reduce spoilage and scrap losses.

WEIRTON STEEL CO.

WEIRTON, W. VA. *Sales Offices in Principal Cities*

Division of **NATIONAL STEEL CORPORATION** *Executive Offices, Pittsburgh, Pa.*

SPECIFY P-K AND GET . . .

GROUND THREADS

IN SOCKET SET SCREWS

THREAD GRINDING, once reserved for screws used in the finest precision equipment, now gives P-K Socket Set Screws the mirror-smoothness characteristic of a ground finish—free from nicks, burrs, hardening scale and other imperfections common to cut threads. Made from hardened blanks, free from hardening distortion, uniform dependable Class 3 Fit is assured.

COMPARE! ASK FOR SAMPLES. See why P-K Ground Thread Socket Set Screws are different from ordinary set screws as night and day . . . why they will speed assemblies, improve strength and safety. You'll agree your products will benefit—assembly-wise and sales-wise! Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.

AVAILABLE FOR PROMPT DELIVERY

GOOD JUDGEMENT CALLS FOR

PARKER-KALON

WHEN GOOD DESIGN CALLS FOR

SOCKET SCREWS

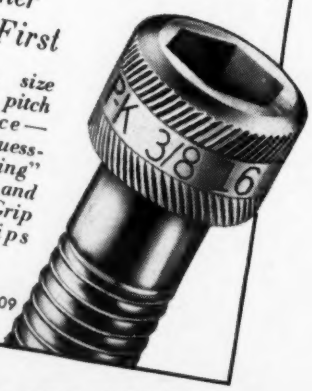
SOLD ONLY
BY ACCREDITED DISTRIBUTORS

SIZE-MARKED • GEAR GRIP* SOCKET HEAD CAP SCREWS

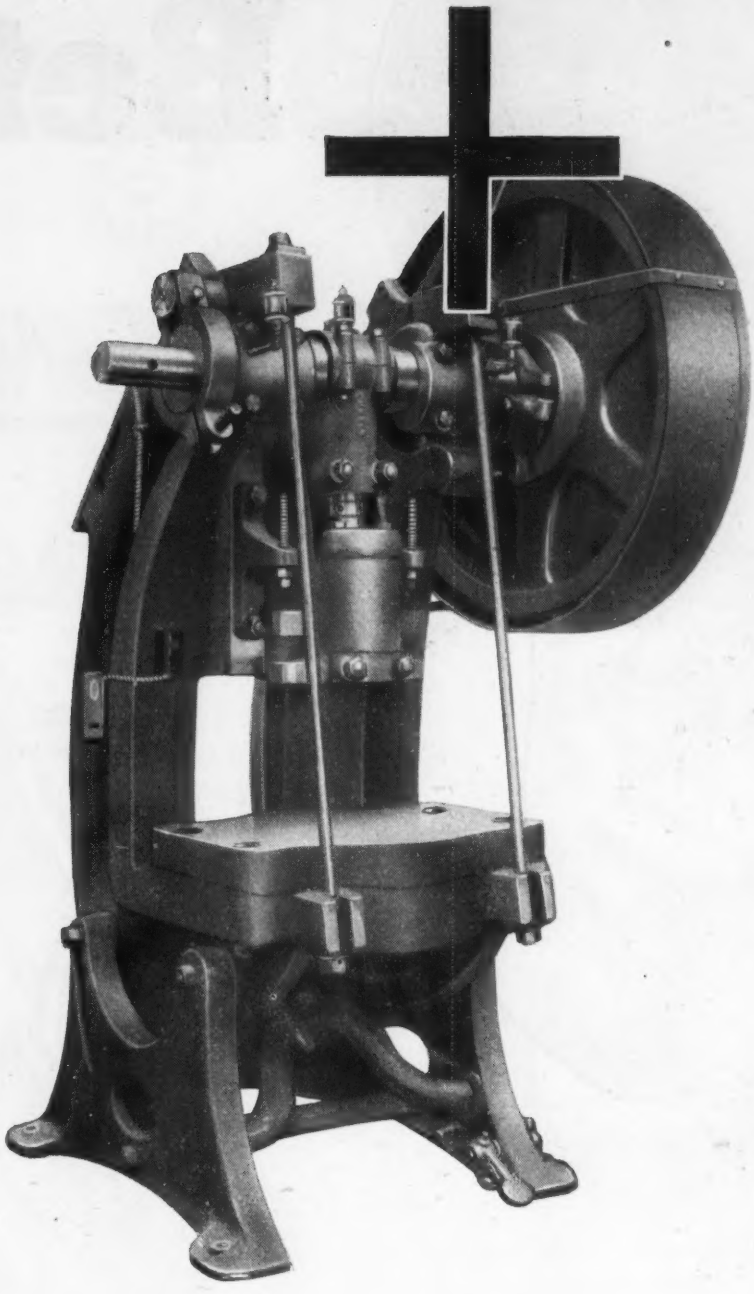
Another P-K First

Gives you size and thread pitch at a glance—eliminates guessing or "miking"—saves time and errors. Gear Grip prevents slips and fumbles.

*U.S. Pat. No. 126,409



WRITE FOR SAMPLES



FERRACUTE PRESSES ARE FAMOUS FOR *plus values*

PLUS strength, PLUS safety factors, PLUS capacity has always been characteristic of FERRACUTE since the days of our Founder, Oberlin Smith. Frankly, we sometimes wonder whether, in these modern days of doing only the least necessary, we have been foolish in sticking to the tradition. But FERRACUTE PLUS VALUES have paid off for our customers through 84 years in long wear, low maintenance, splendid safety records, all-round economy, efficiency and versatility.

In our C-10 series, INCLINABLE UTILITY PRESSES, here are typical FERRACUTE PLUS VALUES:

+ Unusually heavy frame, resulting in minimum deflection and maximum die life.
+ Ferracute low-maintenance clutch.
+ Extra long gib service to give longer die life and less maintenance.
+ Adjustable ground gibs and ram.
+ Ample shut height.
+ Safety flywheels.
+ Quick and easy change-over from single stroke mechanism to continuous operation.
+ Back shaft equipped with roller bearings on larger press. Small sizes bronze bushed.
+ Press will accommodate die cushion without change.
+ Provision for applying air ram balance easily it desired.
+ Quick application of standard roll feeds.

INCLINABLE UTILITY PRESSES

For cutting, punching, stamping, shallow drawing and forming. Inclinable models from 5 to 150 tons. Immediate shipment on some sizes. Very prompt deliveries on all. Write for full specifications and information.

FERRACUTE

MACHINE COMPANY

BRIDGETON, NEW JERSEY, U. S. A.

Better, f
Sureweld
ELECTRODES

r, faster, easier...

every time

To Be Sure, Say Sureweld

The "reliably uniform performance" that has won thousands of satisfied Sureweld users is not accidental. Four distinct factory laboratories safeguard the perfect performance of Sureweld electrodes on *every* job . . . *every* time.

These four watchdogs of quality are the chemical, physical, research and welding laboratories —each a complete entity . . . in an NCG scientific team. From such careful analytic control come the uniformly good bead appearance, the speed and easy operation, the ease of slag removal, the surprisingly low spatter loss . . . that give Sureweld big volume preference.

This uniformity of performance extends uniformly throughout all the needs of industry, too —for all types of welds and all kinds of weldable metals. Yes, there *is* a Sureweld electrode to do any welding job—and do it better, faster and easier. And all types of Sureweld rods are quickly available to you from a vast network of hundreds of independent NCG distributors and warehouse stocks.

Wise and seasoned NCG counsel, too, is yours for the asking, to help on any welding problem. Free of bias because of NCG's 30 years' concern with *both* flame and arc welding, NCG's careful recommendations have effected savings and speed-ups in many a U.S. industrial method . . .

You bet, you can rely on NCG for service...and on Sureweld for cleaner, faster, stronger welds.

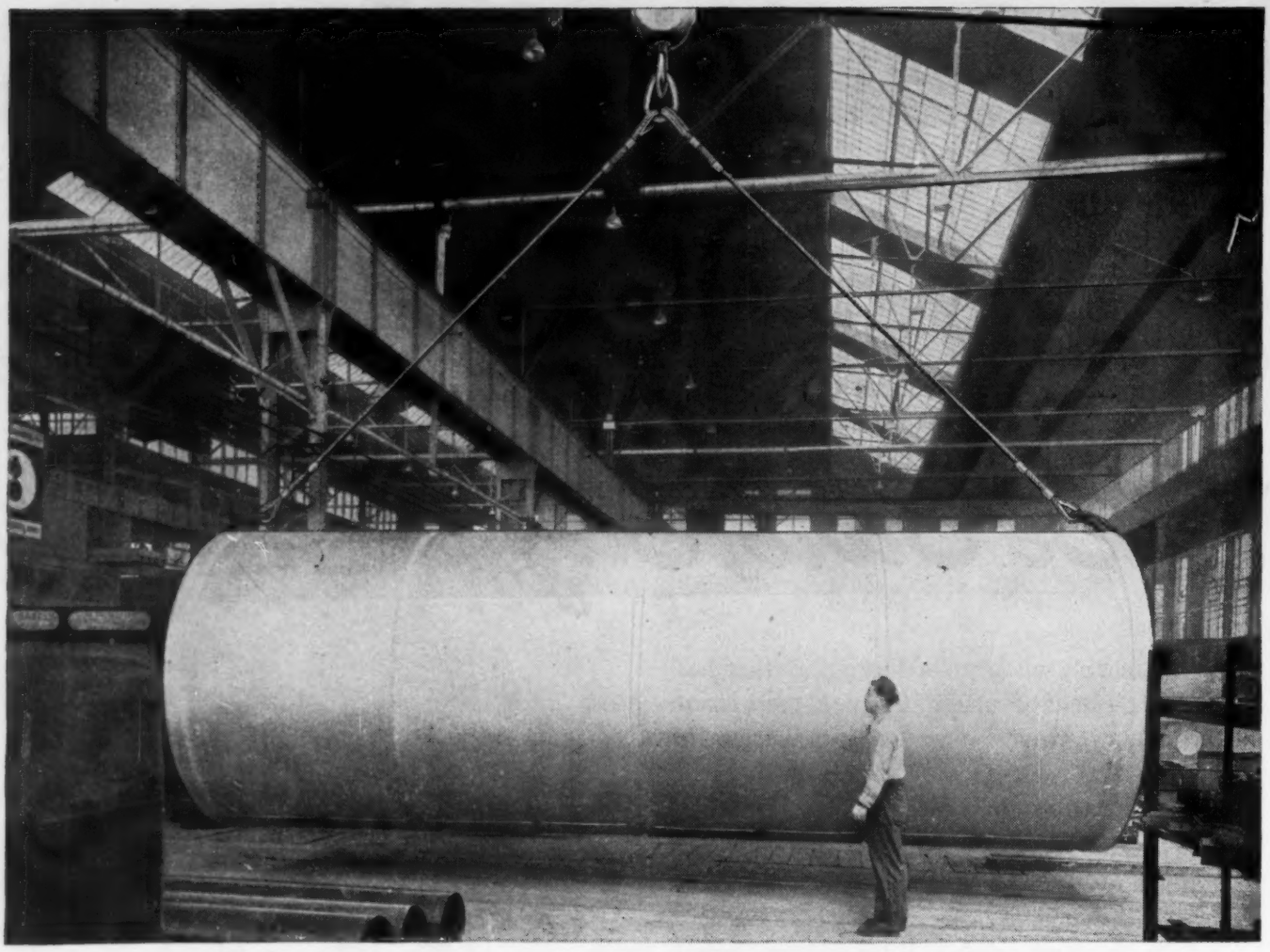
NATIONAL CYLINDER GAS COMPANY
HOLLUP DIVISION
840 N. Michigan Ave., Chicago 11, Ill.

NCG

EVERYTHING FOR WELDING

NCG is recognized as one of the largest organizations of its kind in the world. It operates 73 manufacturing plants within the United States, offers supply and service by a vast network of hundreds of independent NCG distributors and warehouse stocks. For assured satisfaction in *your* welding and cutting needs . . .

RELY ON NCG



ACCO Registered WIRE ROPE SLINGS ARE SIMPLE TO USE... SAFE TO USE

WILKES-BARRE, PA.—Since the development by American Chain & Cable of a complete line of Acco Registered Wire Rope Slings, clumsy, awkward pieces of equipment are now handled as simply . . . and easily . . . as common loads. Take this 8′x24′ dehydrator tank which weighs 23,500 lbs. It is an easy load for a 1″, 2-leg Strand-Laid Acco Sling with thimble loops. Even with the legs at an angle of 50° from the perpendicular, a safety factor of 5-to-1 is maintained.

Safety is a built-in characteristic of every Acco Registered Wire Rope Sling. These slings are proof-tested at the factory with a load double the rated capacity.

Acco Registered Wire Rope Slings are now available at mill supply houses. They are carried in popular lengths and diameters in both Strand-Laid and the amazingly flexible Cable-Laid. Check with your mill supply salesman today or write the nearest Acco district office for details of the "simple to use . . . safe to use" Acco Registered Wire Rope Slings.

UNIVERSAL SAFETY

MEMBER
THE NATIONAL SAFETY COUNCIL

ACCO

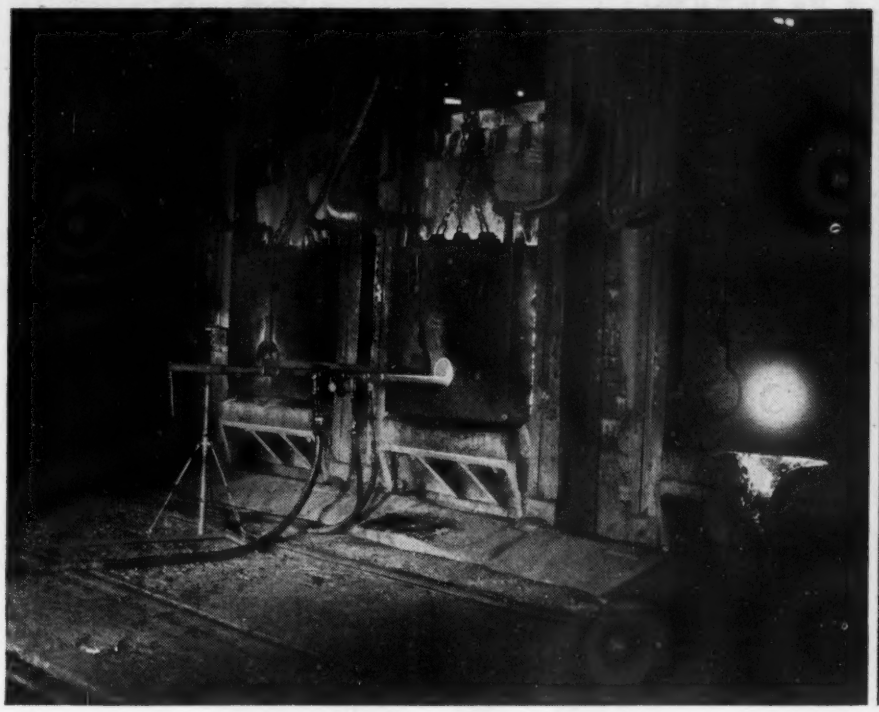
Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

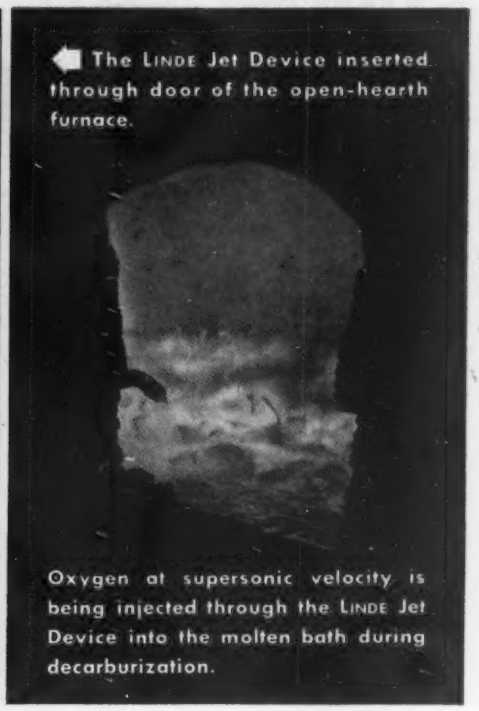
TRADE MARK

WIRE ROPE SLING DEPARTMENT
AMERICAN CHAIN & CABLE

In Business for Your Safety

What's the Story on Oxygen in Steel-Making Furnaces? No. 2 of a Series (No. 1 was a general review)





The LINDE Jet Device inserted through door of the open-hearth furnace.

Oxygen at supersonic velocity is being injected through the LINDE Jet Device into the molten bath during decarburization.

OXYGEN
Speeds Decarburization

THE GREATEST AMOUNT OF EXPERIMENTAL WORK on use of oxygen in the steel-making furnace has been directed toward shortening the refining period. Data on oxygen* use in more than 6,500 heats in 34 mills with which LINDE has co-operated have been recorded. Among these data are records of tests in which oxygen of various purities, compressed air, and even nitrogen, were injected into the molten bath.

All these tests produced rates of decarburization better than are obtained through normal ore practice. The effectiveness was greater, however, the higher the oxygen purity. With high-purity oxygen, rates of carbon reduction were increased two to four times over normal rates. Both the lance and Jet Device were used to introduce the oxygen.

Before final acceptance is assured, the equipment for injecting oxygen must be mechanized. The LINDE Jet Device, a water-cooled non-consumable tool, seems at present to offer the best opportunity for mechanization that will eliminate interference with charging procedures.

Much more extensive experience in individual shops must be gained before the optimum oxygen purity for use in each phase of steel-making can be determined.

*Supplied mostly as DRIOX high-purity liquid oxygen. Economics of low-purity gaseous oxygen will depend on purity, quantity, pressure required; size of storage facilities; and other demand characteristics.

Management and production executives are invited to write for the factual report which LINDE *has prepared on oxygen use in steel-making furnaces. Please address Room 308, 30 E. 42nd St., New York 17, N. Y.*

Linde
Trade-Mark

THE LINDE AIR PRODUCTS COMPANY
Unit of Union Carbide and Carbon Corporation
30 E. 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

The words "Linde" and "Driox" are registered trade-marks of The Linde Air Products Company.

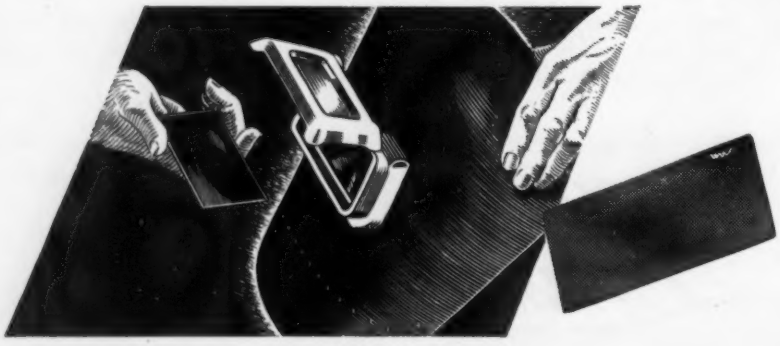
under "Arc Lights"... think of WILLSON

Style No. 130

A LITTLE MONEY GOES A LONG WAY. . . to give dependable protection to face and eyes in this ruggedly built, low cost helmet. Willson-Weld glass in non-corrosive metal holder.

Style No. 60S

GIVE WELDERS' EYES A LIFT . . . Flip-front on this one piece helmet allows quick, easy inspection and is convenient for working in close quarters. Willson-Weld Glass in hinged portion.



WW THE MARK OF MEASURED PROTECTION . . . The Willson-Weld* trade-mark on welding glass is your assurance of accurate grading for density of shade and thickness to meet or exceed government specifications.

*Reg. U. S. Pat. Off.

For complete information on these products and their application, as well as many more eye and respiratory protective devices, get in touch with your nearest Willson distributor or write us direct.

GOGGLES • RESPIRATORS • GAS MASKS • HELMETS

DOUBLE WILLSON

PRODUCTS INCORPORATED

Established 1870

233 WASHINGTON STREET • READING, PENNA.

When Elevators had their first Birthday— "STANDARD" products celebrated their 65th

The first closed car elevator was devised by Otis G. Tufts shortly before the Civil War. The car traveled up and down on a huge screw, 20 inches in diameter, extending from top to bottom of the building. The illustration shows a demonstration in New York about 1870. This invention was equally as important as structural steel in permitting development of America's skyscrapers.

During this same period "Standard" was giving American industry a lift with its quality ferrous products. With eight fires and five hammers, plant output was approximately 1000 tons of blooms and 400 tons of bars annually. The recently installed tire mill had a capacity of 2000 tires a year.

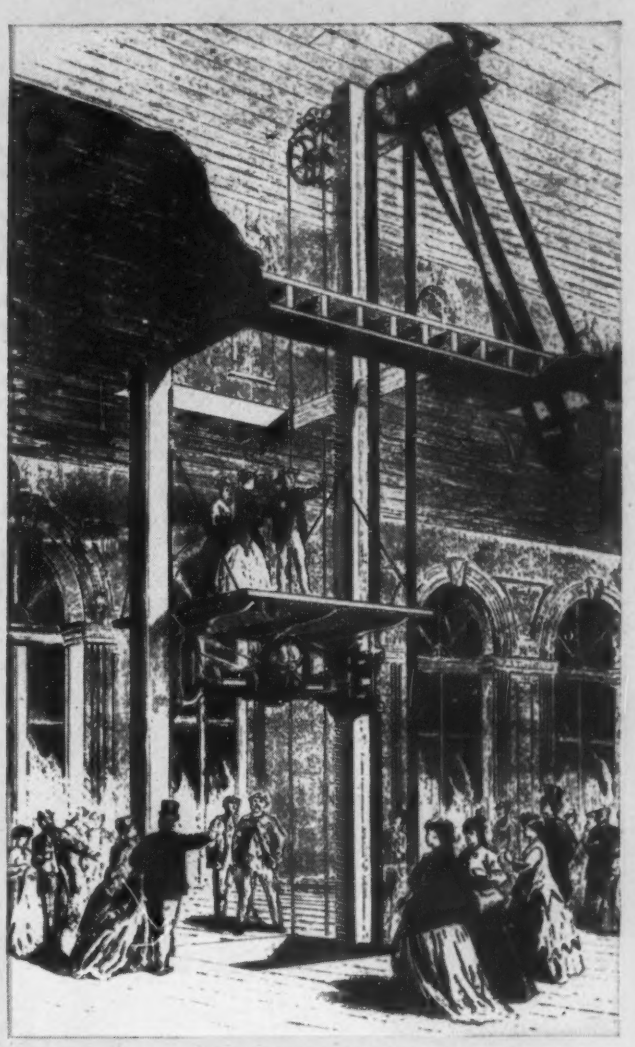


PHOTO FROM BETTMAN ARCHIVES

Standard facilities and production today dwarf these early achievements . . . but the same emphasis on continuous supervision and unfailing quality control has been steadily continued. For your forging and casting needs, just "Standardize on Standard." The Baldwin Locomotive Works, Standard Steel Works Division, Burnham, Pa., U. S. A. Offices: Philadelphia, New York, Boston, Birmingham, Houston, St. Louis, Chicago, Cleveland, San Francisco, Seattle, Washington, Pittsburgh,

STANDARD STEEL WORKS DIVISION

BLW THE BALDWIN GROUP

BALDWIN

FORGINGS AND CASTINGS

THE lustrous, lifetime beauty of Allegheny Metal, America's pioneer stainless steel, makes it a "natural" for the external bright-work of the new cars. It's bright *all the way through*—there's no plating to wear off. What could be sweeter?

Outside the car, Allegheny Metal gives you lasting beauty . . . under the hood, it gives you lasting service. Stainless steel in crucial parts of carburetors, fuel and water pumps and exhaust systems, etc. will literally outwear the car. In fact, Allegheny Metal is ideal for *any* use where resistance to corrosion and heat are vital, and where superior strength and ease of cleaning mean more profitable operation.

We've increased the supply of Allegheny Metal—it's available *now,* in any form or shape. Learn how easy it is to fabricate, how actually cheaply it can solve many a production problem . . . **WRITE FOR ANY TECHNICAL DATA OR SPECIAL ASSISTANCE YOU NEED.**

ALLEGHENY LUDLUM STEEL CORPORATION Pittsburgh, Pa.

PIONEER IN SPECIALLOY STEELS

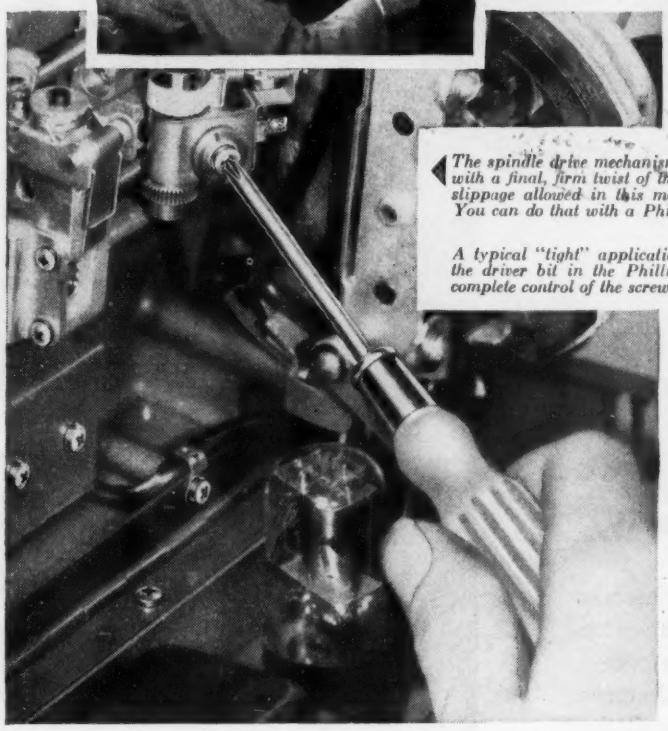
W&D 976C

ALLEGHENY METAL is stocked by all JOS. T. RYERSON & SON, Inc., Warehouses

"Indispensable to the exacting assembly of precision electronic instruments!"

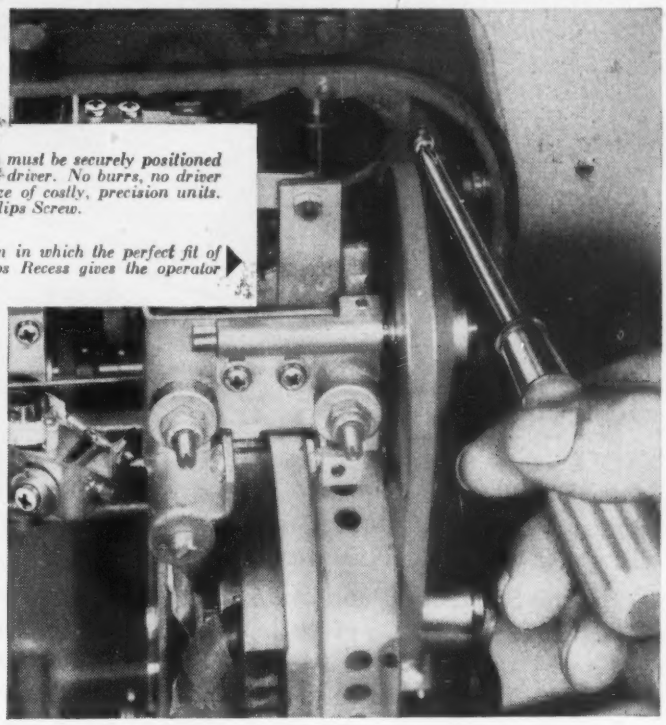
say the makers of the Gray AUDOGRAPH

High spots from an independent survey . . . part of a continuing study by James O. Peck Co., of assembly savings made with Phillips Screws in leading plants.



The spindle drive mechanism must be securely positioned with a final, firm twist of the driver. No burrs, no driver slippage allowed in this maze of costly, precision units. You can do that with a Phillips Screw.

A typical "tight" application in which the perfect fit of the driver bit in the Phillips Recess gives the operator complete control of the screw.



"OUR MAJOR PROBLEM on the Audograph, an advanced electronic soundwriting machine," explained Gray's chief engineer, "is assembling small precision components without disturbing fine tolerance or damaging highly finished surfaces. Phillips Screws are the surest solution of that problem.

"PRECISE ASSEMBLY EASIER WITH PHILLIPS. The perfect fit of the driver in the recessed head speeds finding the thread. Operators easily position each component precisely. Driving in constricted places and at angles is far easier with Phillips Screws.

"AVOID DRIVER SLIPPAGE. 'Skids' would be very costly where so many precision units and expensively finished parts are compactly assembled. The cost of such damage would be out of all proportion to the cost of the parts . . . when interruption of our production due to disassembly and reassembly is figured in. At several points even a slight burr on a screw head could disturb the precision of a vital part. Phillips Screws remove the possibility of such damage.

"PHILLIPS HEAD IS PART OF SMOOTH STREAMLINING. The neat, modern appearance of the recessed head complements the ultra modern design of the Audograph."

YOU'LL FIND ANSWERS TO QUESTIONS about your own assembly costs in the complete report of the Audograph assembly . . . and in other reports, covering wood, metal and plastic products . . . FREE on request. Mail the coupon TODAY!

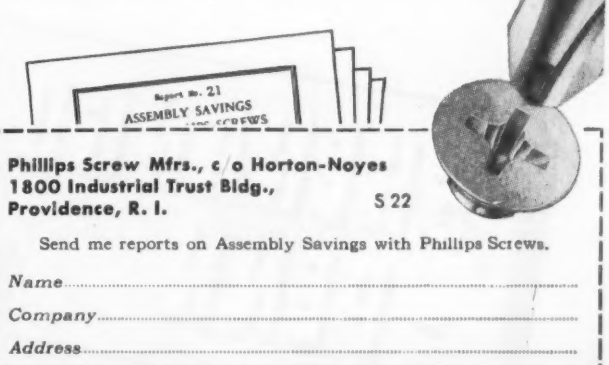
PHILLIPS *Recessed Head* SCREWS

Wood Screws • Machine Screws • Self-tapping Screws • Stove Bolts

American Screw Co.
Central Screw Co.
Continental Screw Co.
Corbin Screw Div. of American Hdwe. Corp.
Elco Tool & Screw Corp.
The H. M. Harper Co.
International Screw Co.
Lamson & Sessions Co.
Milford Rivet and Machine Co.
National Lock Co.

24 SOURCES

National Screw & Mfg. Co.
New England Screw Co.
Parker-Kalon Corporation
Pawtucket Screw Co.
Pheoll Manufacturing Co.
Reading Screw Co.
Russell Burdsall & Ward Bolt & Nut Co.
Scovill Manufacturing Co.
Shakeproof Inc.
The Southington Hardware Mfg. Co.
The Steel Company of Canada, Ltd.
Sterling Bolt Co.
Stronghold Screw Products, Inc.
Wolverine Bolt Company



Phillips Screw Mfrs., c/o Horton-Noyes
1800 Industrial Trust Bldg.,
Providence, R. I. S 22

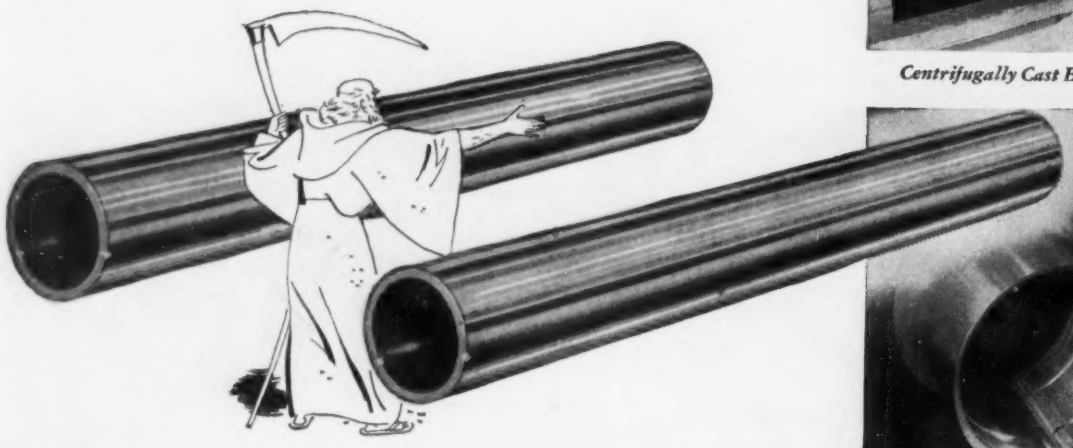
Send me reports on Assembly Savings with Phillips Screws.

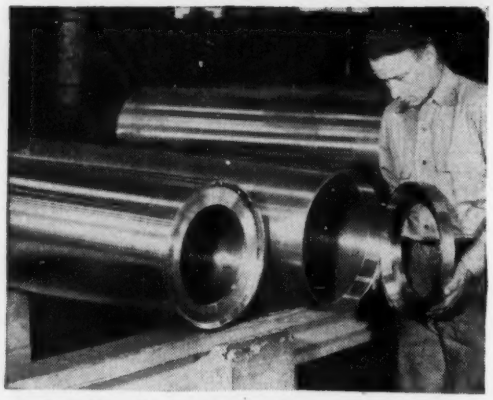
Name.....

Company.....

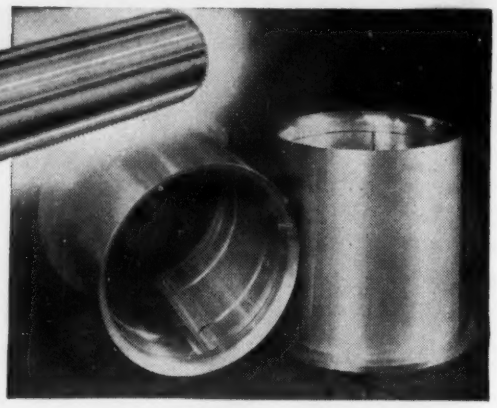
Address.....

Only time
can tell them apart

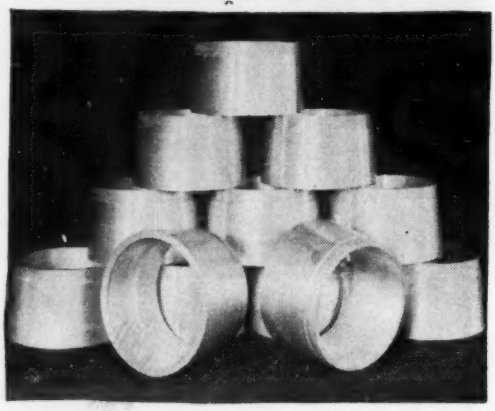




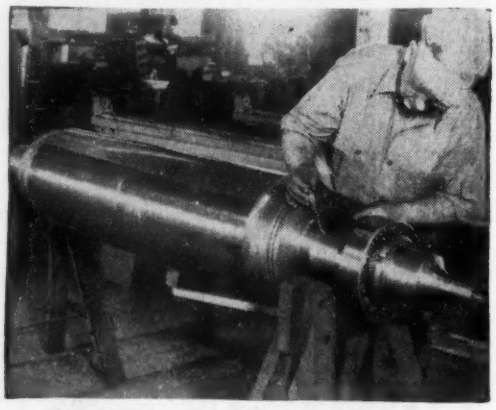
Centrifugally Cast Bronze Printing Press Rolls



Centrifugally Cast Rubber Refiner Bearings



Centrifugally Cast Aluminum Parts, Rough Machined



Centrifugally Cast Textile Machinery Roll

ROLLS and symmetrical machinery parts that are *centrifugally* cast by Shenango-Penn and those produced by ordinary methods may *look* identical. But time, time in service, will show you a big difference!

For the Shenango-Penn centrifugal process makes metals more homogeneous . . . gives them a generous extra measure of the very qualities that are so important in tough services: measurably greater tensile strength to better withstand stress and shock, greater density for prolonged wear-life and resistance to abrasion and corrosion, and a freedom from porosity, sand inclusions and blow holes that rounds out a picture of unsurpassed performance every time.

FREE BULLETIN No. 143 *tells all about our made-to-order centrifugal castings, ferrous or non-ferrous, small or large, rough, semi or finish machined; tells also about savings right from the blueprint stage on through.*

FREE BULLETIN No. 145 *tells all about our standard* centrifugally cast *bushing stock, in all popular sizes, always ready for immediate delivery.*

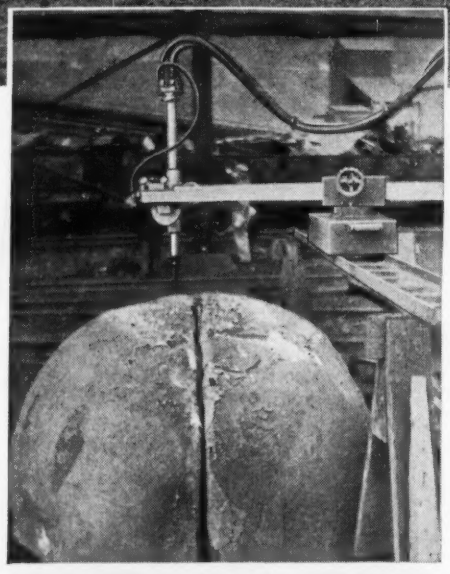
Send today for either or both of these free bulletins.

SHENANGO-PENN MOLD COMPANY
471 WEST THIRD STREET • DOVER, OHIO
Executive Offices: Pittsburgh, Pa.

SHENANGO-PENN

ALL BRONZES • MONEL METAL • ALLOY IRONS

Here are THREE economical ways to cut heavy scrap to charging box size



Today, Airco offers steel men three outstanding oxyacetylene cutting methods that permit easy and economical handling of heavy scrap. Practically any heavy scrapping job falls within their scope . . . regardless of size, shape or location.

1. ***The oxyacetylene torch, plus the oxygen lance*** **. . . The illustration above shows them being used to scrap a heavy button . . . work progresses efficiently without initial handling since chunks can be cut to size in any position.**
2. ***Machine gas cutting*** **. . . This is ideal where crane facilities are available. The setup requires a heavy duty cutting torch on an Airco No. 40 Radiagraph. The two typical skulls shown in fig. 2 were sliced in two in 45 minutes each.**
3. ***The oxygen lance*** **. . . Capable of cutting extremely large sections. In fig. 3 the lance is being used to cut a 75-ton open hearth spill.**

This is another example of the manner in which modern Airco oxyacetylene equipment is helping progressive operators slash time and costs.

Ask to have an Airco Technical Sales Division representative call to supply further information. Address: Dept. 7586, Air Reduction, 60 East 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas.

AIRCO **AIR REDUCTION**

Offices in All Principal Cities

Headquarters for Oxygen, Acetylene and other gases . . . Carbide . . . Gas Welding and Cutting Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

When your future **looks too big for your present plant capacity**

. . . the Allied technical staff is at your elbow, all set for consultation or estimating your structural steel requirements. If your specifications are already on paper, send them to us for quotation on the fabricated structural steel work.

We have fabricated and erected the structural steel for many industrial plants, large and small; for public buildings and port facilities; for hangars and highway bridges. We shall be glad to assist you in the same way.

(Construction progress photos courtesy of the John Deere Dubuque Tractor Company, Dubuque, Iowa)

ALLIED STRUCTURAL STEEL COMPANIES
Engineers • Fabricators • Erectors
Send All Inquiries To Our Sales Engineering Dept.
20 N. WACKER DRIVE, CHICAGO 6, ILL.

PLANTS: ● CLINTON BRIDGE WORKS, Clinton, Iowa
● GAGE STRUCTURAL STEEL CO., Chicago, Ill
● MIDLAND STRUCTURAL STEEL CO., Cicero, Ill

3 PLANTS
Working as one huge operation to get your Structural Steel Fabricated and Erected

Please send your engineers to discuss our new building project —— Joseph Brown, International Company

If You Have a New Building Project

—We can help you, too

For your convenience, the engineering and estimating departments of all three plants are combined in our new offices in Chicago. Mail your inquiries and correspondence to us at our new address.

ALLIED STRUCTURAL STEEL COMPANIES • 20 N. WACKER DRIVE, CHICAGO 6, ILL.

Use the new HAYNES Flux-Coated Rods on your next hard-facing job

Fast, easy application
Sound, uniform deposit
Steady, quiet arc
Easy slag removal

HAYNES hard-facing alloys with greatly improved coatings are now available for metallic arc welding. Use them on your next job to protect metal parts from abrasion, heat, and corrosion.

The registered trade-marks "Haynes," "Haynes Stellite," "Hascrome," "Hastelloy," and "Haystellite" distinguish products of Haynes Stellite Company.

One of These HAYNES Hard-Facing Rods Will Do Your Job

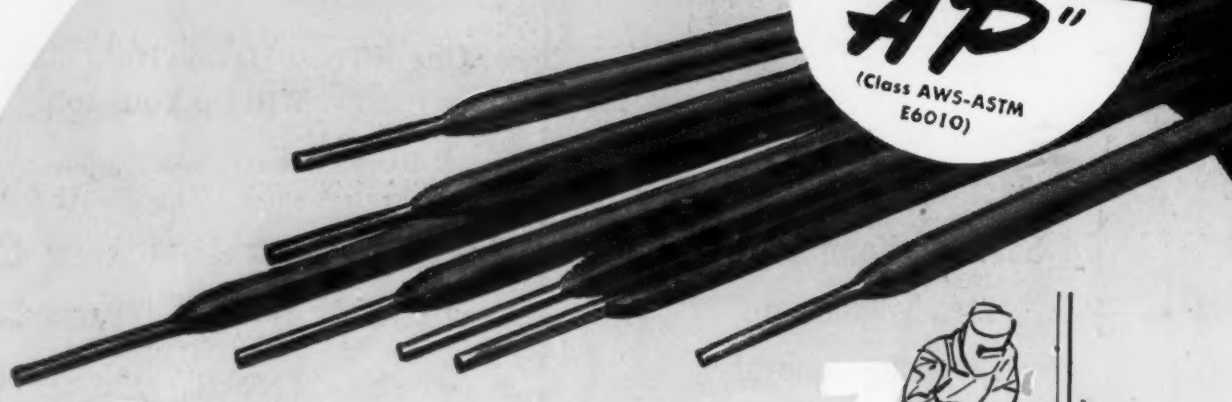
1. HAYNES STELLITE Rods . . . cobalt-chromium-tungsten alloys . . . high in red hardness and highly resistant to abrasion and corrosion.
2. HAYNES STELLITE "93" Rod . . . iron-base alloy . . . resistant to abrasion.
3. HASCROME Rod . . . iron-base alloy containing chromium and manganese . . . work-hardens under impact.
4. HAYSTELLITE Rods . . . tungsten-base alloy and steel binder . . . extremely resistant to abrasion.
5. HASTELLOY Rods . . . nickel-base alloys . . . resistant to heat and abrasion and highly resistant to corrosion.

Haynes Stellite Company
Unit of Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Chicago—Cleveland—Detroit—Houston
Los Angeles—New York—San Francisco—Tulsa

HAYNES TRADE-MARK *alloys*

Do all three! with this ONE P&H Electrode.....

P&H "AP" (Class AWS-ASTM E6010)



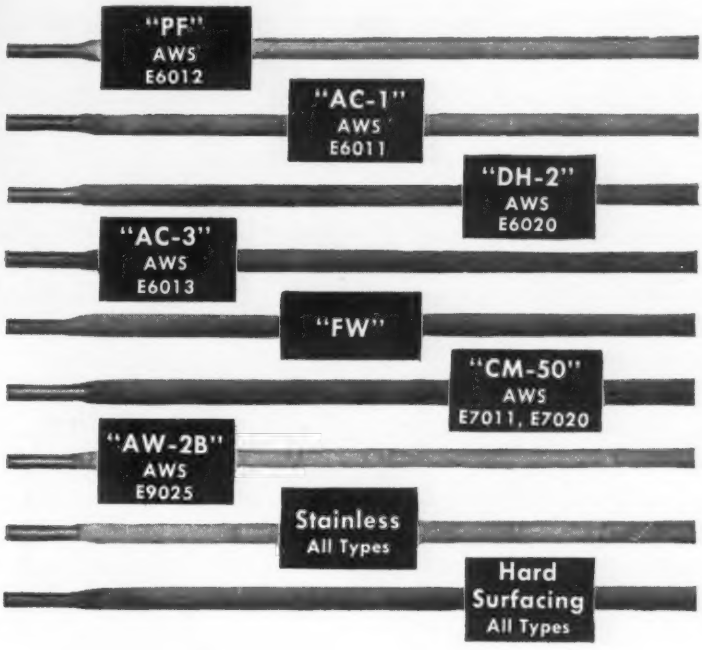
There's no limit to the applications of this unusual P&H Electrode—and the money it can save you. Production, construction and maintenance welding — "AP" excels in them all.

By virtue of its unique adaptability, "AP" enables you to cut electrode stocks, trim costs, eliminate waste, simplify procedures. It's an electrode so versatile, it will answer many of your welding problems.

"AP" gives you fast, sound welds—and does it in any position. It has a deep penetrating spray type arc and a thin, easily removed slag.

You can profit by the complete P & H Arc Welding Service

Whatever your welding electrode needs, you can choose the correct types and sizes from the complete P&H line. Below are only a few of many that meet every requirement for welding mild steels, alloy and stainless steels, cast iron and for building up and hard surfacing. Write for complete P&H Electrode Bulletin R7-5.



P&H

WELDING ELECTRODES

4411 West National Ave.
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

WELDING ELECTRODES · MOTORS · HOISTS · P&H · ELECTRIC CRANES · ARC WELDERS · EXCAVATORS

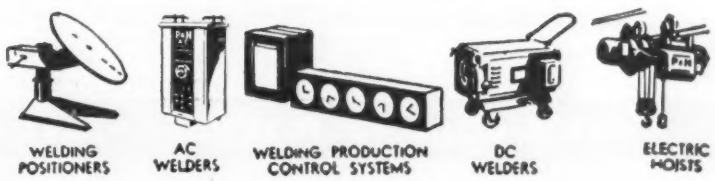
Welding Positioners • AC Welders • Welding Production • Control Systems • DC Welders • Electric Hoists.

Let One Electrode Do the Work of Many!

use "AP"

Call Your P&H Representative, or Write for Literature.

AMERICA'S MOST COMPLETE ARC WELDING SERVICE



WELDING POSITIONERS · AC WELDERS · WELDING PRODUCTION CONTROL SYSTEMS · DC WELDERS · ELECTRIC HOISTS

Triple-Tested PRODUCTION METHOD

Still going strong! One of the first Monarch Magna-Matics installed in the original battery of machines purchased by a prominent tractor manufacturer to turn cast-iron cylinder liners to unusual tolerances.

Third endorsement of the Monarch Magna-Matic. One of five machines in the second repeat order by this one customer to handle increased production demand for these tubular-shaped precision parts.

Cast-iron cylinder liners, 4″ diam. x 10″ long, turned to concentricity of .0002″ and a straightness of .0005″ with the center-line of the bore; diameter limit .0005″.

How well the Monarch Magna-Matic meets those tolerances is attested by the repeat orders—three batteries of machines shipped to the same customer.

This adaptation of a standard machine to the specialized production requirements of an individual user is typical of the know-how built into Monarch Metal Turning Equipment. Our engineers will be glad to translate this experience in terms of your needs—to give you *peak production at a profit.* May we hear from you?

THE MONARCH MACHINE TOOL COMPANY · Sidney, Ohio

ACCURACY · ECONOMY · LONG LIFE

Monarch TURNING MACHINES

FOR A GOOD TURN *FASTER*—TURN TO MONARCH

EDITORIAL STAFF

E. L. SHANER
Editor-in-Chief

IRWIN H. SUCH
Editor

WM. M. ROONEY
News and Markets Editor

J. D. KNOX
Steel Plant Editor

GUY HUBBARD
Machine Tool Editor

DON S. CADOT
Art Editor

ALLEN G. GRAY
Consulting Editor

ASSOCIATE EDITORS

W. J. CAMPBELL • F. R. BRIGGS
JAY DEEULIS • VANCE BELL
WALTER F. TOERGE

ASSISTANT EDITORS

H. C. TUTTLE • DOLORES K. BLAHA
HENRY J. HOLTZ • L. J. SKUDERIN
JOHN S. MORGAN • M. T. BORGERHOFF

RESIDENT EDITORS

E. C. KREUTZBERG
Washington Editor

B. K. PRICE
Eastern Editor, New York

L. E. BROWNE
Associate Editor, New York

E. F. ROSS
Chicago Editor

J. C. SULLIVAN
Pittsburgh Editor

A. H. ALLEN
Detroit Editor

VINCENT DELPORT
European Editor, London

EDITORIAL CORRESPONDENTS

R. W. KINCEY, *Birmingham*
L. C. FELDMANN, *Buffalo*
SAMUEL S. CARR, *Cincinnati*
MAC HUTCHENS, *St. Louis*
GEORGE R. REISS, *Youngstown*
MAURICE BEAM, *Los Angeles*
ROBERT BOTTORFF, *San Francisco*
R. C. HILL, *Seattle*
C. K. CATES, *Dallas*
F. S. TOBIN, *Toronto*
J. A. HORTON, *Birmingham, Eng.*
LEON JAUDOIN, *Paris, France*
JACQUES FOULON, *Liege, Belgium*

MAIN OFFICE

Penton Building, Cleveland 13, Ohio

BRANCH OFFICES

New York 17 .....16 East 43rd St.
Chicago 11 .....520 North Michigan Ave.
Pittsburgh 19 .....2806 Koppers Bldg.
Detroit 2 .....6560 Cass Ave.
Washington 4 .....956 National Press Bldg.
Los Angeles 4 ....130 N. New Hampshire Ave.
London ....2 Caxton St., Westminster, S.W. 1

Business Staff on Page 4

NEXT WEEK . . .

Lubrication of Grinding Machinery

Interrupted Quenching

Mechanized Welding and Cutting

Oxygen Generation Developments

Small Diameter Work Rolls

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 121, NO. 16 OCTOBER 20, 1947

NEWS

★ As the Editor Views the News 53
Consumers Like Steel Pricing System 57
Efforts Renewed To Boost Car Output to 10,000 Monthly 59
★ Present, Past and Pending 59
Prepare for Return of Buyers' Market, Porcelain Enamelers Told 60
Lack of Controversy Lessens Union Interest in Safety Programs 60
Sheet Distributors Told 1947 Output To Hit 17 Million Tons ... 61
Cut in Pig Iron Production Seen at Turn of Year 62
Record Peacetime Steel Shipments to Fabricators Indicated 63
JANMAT Takes Major Portion of Surplus Tools 64
Changes Announced in GE Apparatus Division 65
Fuel Oil Supply To Grow Tighter During Winter 65
★ Windows of Washington 66
Study Shows Only Two Industries Had Larger War Earnings ... 69
British Adopt Important New Patent Policy 70
MIT Plans Basic Turbine Studies in New Facility 70
Larger British Exports May Cut Domestic Supply 71
★ Mirrors of Motordom 73
American Brake Shoe Co. Opens Modern Foundry 76
★ Briefs 77
★ The Business Trend 78
★ Men of Industry 80
★ Obituaries 85
★ Construction and Enterprise 162

TECHNICAL

Stability of Steel at Elevated Temperatures 86
Press-Shaping Bath Tubs 90
★ Seen and Heard in the Machinery Field 92
Forming Steel by Cold Extrusion 93
How To Determine Method of Martempering Steel 94
First Coke Pushed from New Lorain By-Product Ovens 98
★ Engineering News at a Glance 100
Blast Furnacemen Stress Sound Hearth Construction 102
Standardizing Specifications for Engineering Materials 106
★ New Literature 111
★ Progress in Steelmaking—Oxygen Generation Developments ... 114
★ New Products and Equipment 131
★ Helpful Literature 139

MARKETS

Steel Supply Stringency Tightest Since War's End 141
★ Market Prices and Composites 142
Stocks of Nonferrous Metals Increasing 146

★*Index to Advertisers* 172

★—Denotes regular features.

AT YOUR FINGERTIPS...

Convenient TABULAR DATA

...aids in the selection of correct

ALLOY COMPOSITIONS

for HEAT and CORROSION RESISTANT CASTINGS

● To facilitate specification of alloy castings for service under conditions of elevated temperature, severe corrosion, or both, the Alloy Casting Institute has adopted a series of designations to cover all standard types of compositions recommended for such service. Copies of these convenient listings are available on request. Use them when ordering or specifying Nickel-Chromium-Iron alloy castings.

Write today for your copy.

	1 max.	11 to 14	.15		
	1 max.	11 to 14	.20		
CB-30	2 max.	18 to 22			
CC-50		26 to 30			
CE-30		26 to 30			
CF-7		18 to 20			
CF-10	8 to 10	18 to 20	.10 max.		
CF-16	8 to 10	18 to 20	.16 max.		
CF-20	8 to 10	18 to 20	.20 max.		
CF-7 Se	8 to 10	18 to 20	.07 max.		
CF-7 C	8 to 10	18 to 20	.07 max.		
CF-7 M	8 to 10	18 to 20	.07 max.		
CF-10 M	8 to 10	18 to 20	.10 max.		
CF-16 M	8 to 10	18 to 20	.16 max.		
CG-7	10 to 12	20 to 22			
CG-10	10 to 12	20 to 22	.10 max.		
CG-16	10 to 12	20 to 22	.16 max.		
CG-16 Se	10 to 12	20 to 22	.16 max.		
CG-7 C	10 to 12	20 to 22	.07 max.		
CG-7 M	10 to 12	20 to 22	.07 max.		
CG-10 M	10 to 12	20 to 22	.10 max.		
CG-16 M	10 to 12	20 to 22	.16 max.		
CH-10	12 to 15	22 to 26	.10 max.		
CH-20	12 to 15	22 to 26	.20 max.		
CH-10 C	12 to 15	22 to 26	.10 max.		
CH-10 M	12 to 15	22 to 26	.10 max.		
CK-25	19 to 22	23 to 27	.25 max.		
CM-25	19 to 22	23 to 27	.25 max.		
CN-7	20 to 30	18 to 22	.07 max.		
CT-7	34 to 37	13 to 17	.07 max.		
HB	2 max.	10 to 14	.30 max.	—	—
HC	4 max.	26 to 30	.50 max.	—	—
HD	3 to 6	26 to 30	.50 max.	—	—
HE	8 to 11	26 to 30	.20 to .50	—	—
HF	8 to 11	18 to 23	.20 to .40	—	—
HH	11 to 14	24 to 28	.20 to .50	—	—
HI	14 to 17	26 to 30	.20 to .50	—	—
HK	19 to 22	23 to 27	.20 to .60	—	—
HL	19 to 22	28 to 32	.20 to .60	—	—
HN	23 to 26	18 to 22	.20 to .50	—	—
HP	29 to 31	28 to 32	.35 to .75	—	—
HS	29 to 32	8 to 12	.35 to .75	—	—
HT	33 to 37	13 to 17	.35 to .75	—	—
HU	37 to 41	17 to 21	.35 to .75	—	—
HW	58 to 62	10 to 14	.35 to .75	—	—
HX	64 to 68	15 to 19	.35 to .75	—	—

EMBLEM OF INCO SERVICE TRADE MARK

Over the years, International Nickel has accumulated a fund of useful information on the selection, fabrication, treatment and performance of engineering alloy steels, stainless steels, cast irons, brasses, bronzes and other alloys containing Nickel. This information is yours for the asking. Write for "List A" of available publications.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N.Y.

October 20, 1947

The Red Menace

When the Kremlin resurrected the Comintern and openly assigned to it the task of sabotaging the Marshall Plan, it committed a tactical error. It was an error because it alerted lovers of freedom all over the world to the acute menace of communism.

Already revival of the Comintern has stimulated the zeal of Americans to reduce communistic influence domestically to impotency. During the past week or two, anti-communists in unions have been winning decisions with more regularity than heretofore. Public opinion generally is more cognizant of the threat of activities by Soviet agents than at any time in more than a decade.

This upsurge of resentment against Comintern tactics raises a question as to the efficiency of American efforts to thwart communism at home. Any person who has any knowledge of how the communists operate in this country, knows how well they are organized for effective action. They work from plant, farm, office, street or other units or nuclei up through sections, district bureaus, central committees, national and international organizations, with strict discipline enforced from top to bottom. Everything makes for unity.

Our organization for combatting this subversive influence is weak. It consists largely of a slipshod, heterogeneous confusion of unco-ordinated defenses. Every industrial corporation is besieged by scores of independent national, state and local drives or campaigns for funds to fight the red menace.

Response to these appeals has been liberal. Most of us probably would be amazed at the amount of money that is being contributed for the general purpose of preserving our way of life as an offset to communistic propaganda. Unfortunately much of this money is being wasted in duplicated or misguided effort. If administered more intelligently, the money and effort now being spent would be more than sufficient to reduce communistic influence to harmlessness.

Americans have achieved remarkable success in co-ordinating effort to control disease, to administer relief and to promote other constructive movements. Is it not logical to co-ordinate the multitudinous campaigns against communism so that our efforts will be more effective!

This, combined with renewed vigor in keeping our economic house in order, would lick the present threat of red activity within our borders in jig time.

* * *

LOFTY FRUSTRATION: About two weeks ago the Council of Economic Advisers, headed by Dr. Edwin G. Nourse, informed President Truman that "inflation is here and has gotten out of hand." Since then other administration economists have concurred in this conclusion. As a result, Washington reports not only that the acceleration of the inflationary trend is the chief worry at the White House but also that administration spokesmen admit that there is little they can do to cope with the situation effectively.

This present attitude of frustration at the White House is a logical outcome of the administration's persistent pursuit of fallacious economic policies since V-E Day. First the government threw its support toward combatting the deflation and the serious unemployment that were so freely predicted by left-wingers. Next it swallowed hook, line and sinker the union-sponsored fallacy that wages could be raised drastically without affecting prices. Meanwhile, it was continuing its depression-period policy of paying subsidies to keep up prices of farm com-

(OVER)

modities. It also insists upon maintaining expenditures for ordinary government activities at above prewar levels.

In view of the fact the administration, while condemning inflation vehemently, actually is continuing to wage war against deflation, it is not surprising that its spokesmen now feel frustrated at its impotence in dealing with inflation.

—p. 66

* * *

FACILITIES OVERTAXED: On the basis of its effect upon national economy, stringency in steel supply now is more acute than at any time since the end of the war. Inadequacy of steel supply is reflected in the stoppage of automobile assembly lines, in the shutdown of coal mines in West Virginia because of lack of hopper cars and in hardships endured by fabricators and manufacturers throughout the metalworking industries.

The problem is complicated by the fact that no single factor is responsible for the situation. There is scarcely enough scrap or pig iron to support present steelworks operations. Of 274 Great Lakes freighters qualified to carry iron ore, all but two were in service last Wednesday. Some furnaces now operating should be shut down for repairs. Every facility involved in producing steel is taxed to the limit or beyond it.

Some marking of time is inevitable until lagging materials and services catch up.

—pp. 60, 61, 73, 78, 141

* * *

PROFITS IN WARTIME: Federal Trade Commission has analyzed the financial performance of 4107 companies in 22 major manufacturing groups in the four war years of 1942, 1943, 1944 and 1945 as compared with that of prewar 1941. Only two groups—transportation equipment and beverages—enjoyed higher earnings after taxes in war years than in 1941.

However, net profit after taxes per dollar of sales for the transportation equipment industry, which was 5.3 cents in 1941, averaged only 2.4 during the four war years. Corresponding figures for 1941 and averages for war years for other industry groups are as follows: Iron and steel 7 and 3.9 cents; nonferrous metals 4.6 and 2.9 cents; electrical machinery 6.8 and 3.7 cents; machinery, except electrical, 9.3 and 5.2 cents; and automobile and automobile equipment 7.4 and 4.7 cents.

Obviously there is no basis for a charge of wartime profiteering in these figures. —p. 69

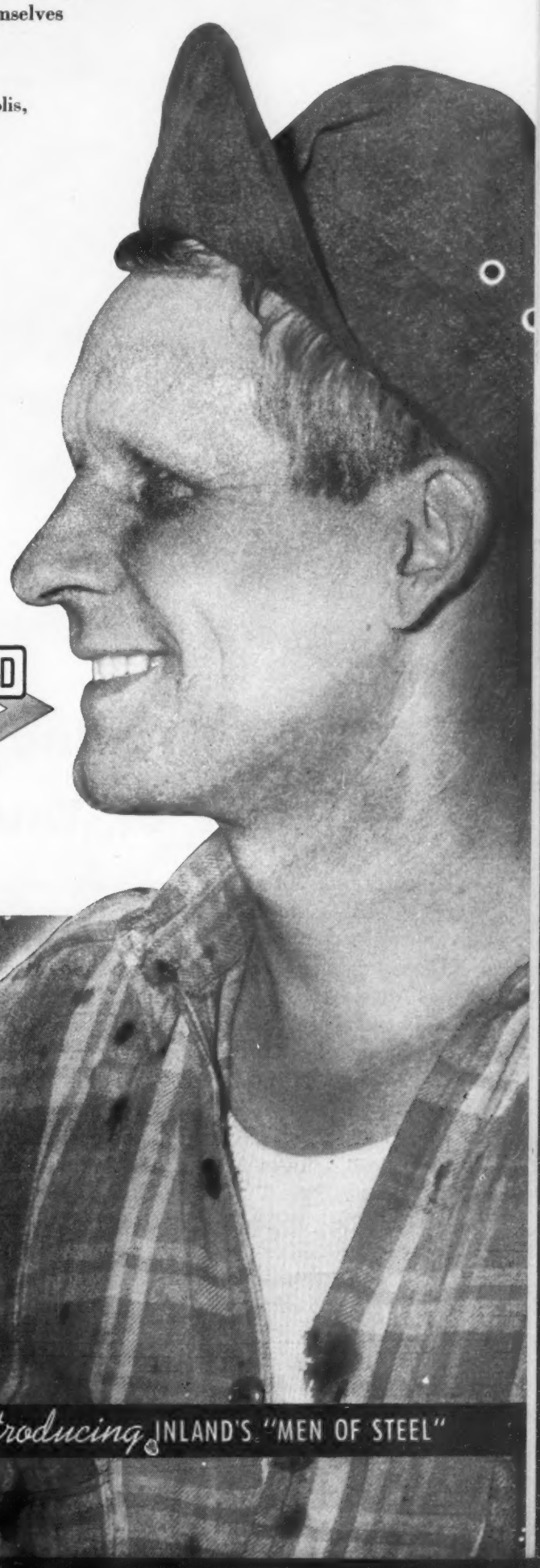
SIGNS OF THE TIMES: A clear-cut indication of the great volume of manufactured goods and produce going into consumption currently is the fact that revenue freight car loadings for the week ended Oct. 4, totaling 942,533 (p. 78), were the highest recorded in 17 years. The figure really understates the volume of traffic because today cars are loaded more heavily, handled faster and moved greater distances than heretofore. . . . Over 800 tons of tungsten ore, being brought in from Korea, may be offered for sale to private buyers by the U. S. Commercial Co. This agency also will open bids Oct. 29 (p. 70) on 23 lots of Japanese lead. It is gratifying to see imports beginning to trickle in from war-devastated areas. . . . At the Willys-Overland institutional day celebration in Toledo last week, Delmar G. Roos, engineering vice president (p. 73), explained the "product philosophy" of W-O of building a complete line of unique, utilitarian and economical vehicles, now numbering eight cars and trucks, around the basic pattern of the jeep. Shown at the Toledo ceremony were the two newest jeep children, a 4-passenger convertible and an all-steel station sedan. . . . A research program for studying the stability of various steels at elevated temperatures was undertaken by National Tube Co. in 1943. To date considerable progress has been made. Object of the investigation is to determine the grades or chemical compositions of steel used in seamless steel pipe (p. 87) which afford the greatest resistance to graphitization with retention of favorable creep rupture characteristics. The studies will involve exposure of steels to high temperatures for various time periods up to 11 years. . . . Now the bottleneck in bituminous coal output is shortage of hopper cars. Production lost because of lack of transportation (p. 78) projected over 1947 is estimated at 18 million tons. . . . Imported German scientists, working under engineers of Heintz Mfg. Co., Philadelphia, on refinements of a process of cold extruding of steel developed in Germany during the war (p. 93) have been able to accomplish results with American facilities that were not attainable in Europe. . . . A check of representative companies in the warm air heating and air conditioning industry (p. 57) reveals an almost solid front of opposition to the f.o.b. mill method of pricing steel.

E. L. Shaner

EDITOR-IN-CHIEF

Eleven years ago, Horace Blackwell came to Inland from an Indiana farm. Seven years later he had moved up from laborer, through pit man, mold inspector, and expediter, to pit foreman of No. 1 Open Hearth—in charge of a crew of thirty. Blackwell is only one of many young men at Inland . . . intelligent and ambitious . . . who are forging careers for themselves in the Inland mills . . . helping to turn out quality steels to your exacting specifications. INLAND STEEL CO., 38 S. Dearborn St., Chicago 3, Ill. Offices: Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

Country Boy Makes Good ...at Inland



INLAND STEEL

BARS • STRUCTURALS • PLATES • SHEETS • STRIP • TIN PLATE
FLOOR PLATE • PILING • REINFORCING BARS • RAILS • TRACK ACCESSORIES

Introducing INLAND'S "MEN OF STEEL"

Taking the Distance Out of Your Steel Problems

Urgently needed by a Los Angeles engineering company, was a large shipment of stainless steel pipe in a special size. A call to the Ryerson plant in Los Angeles disclosed that the required pipe was not in Los Angeles stock, but *was* on hand in another city.

Ryerson Los Angeles immediately phoned Ryerson in Chicago. Could Chicago supply the desperately needed pipe? Chicago could—and did! The material was quickly trucked to a Chicago airport, flown to Los Angeles, and delivered at the customer's plant the following morning, less than 24 hours after the order was received.

That's how Ryerson—when the steel *is* available—can take the *distance* out of your steel problems. That's how the twelve closely cooperating plants of the Ryerson Steel-Service System often accomplish the seemingly impossible in an incredibly short time. And that's the sort of far-reaching service you can look for when you contact any Ryerson plant for any steel requirement.

Joseph T. Ryerson & Son, Inc. Plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.

PRINCIPAL PRODUCTS

Bars—hot and cold rolled alloy steel reinforcing	Mechanical Tubing	Tool Steel
Structurals	Boiler Tubes and Fittings	Wire, Chain
Plates—	Allegheny Stainless—sheets, plates, shapes, bars, tubing, etc.	Bolts, Rivets
Inland 4-Way Floor Plate	Sheet and Strip Steel	Babbitt
		Metal Working Tools & Machinery, etc.

RYERSON STEEL

Multiple basing point system of steel pricing is equitable to most consumers, permits a considerable amount of decentralizat i o n of fabricating industries. Shown here are part of the steel basing points

Consumers Like Steel Pricing System

Prefer present multiple basing point method to f.o.b. mill pricing or return to "Pittsburgh Plus," survey of warm air heating industry indicates. Fear change would bring chaos to metalworking companies already beset by many difficulties

PRESENT multiple basing point system of steel pricing is equitable and is preferred by steel consumers to f.o.b. mill pricing or the old system of "Pittsburgh Plus."

This is the consensus of members of the warm air heating industry, as revealed in a survey undertaken by STEEL in co-operation with the National Warm Air Heating & Air Conditioning Association, Cleveland. The association's membership includes manufacturers of gravity warm air furnaces, forced warm air heating units, pipes, registers, fittings and blowers, all of whom use steel in substantial quantities.

Like Present System — Nearly 88 per cent of those questioned approve the present multiple basing point system. Six per cent believe the present system is indefensible and the remainder qualify their answers.

More than four-fifths of these manufacturers say definitely they prefer the present system to f.o.b. mill pricing. Slightly more than 6 per cent would prefer f.o.b. mill pricing. The remainder qualify their answers on the basis of geographical location and the present market conditions in steel.

Overwhelmingly, the manufacturers oppose a return to the "Pittsburgh Plus" system of pricing.

A majority believes that the adoption of an f.o.b. mill pricing system would further restrict their steel supply sources and would mean increased costs for steel.

System Under Fire—These expressions from steel users in favor of the present pricing system come as the steel industry prepares to defend its position before a renewed attack on the multiple basing point system by the Federal Trade Commission. FTC last August instituted proceedings against the American Iron & Steel Institute and its member companies, charging various monopolistic practices, including price fixing.

The FTC long has held that the multiple basing point system is illegal and has sought its abandonment. Should the multiple basing point system be thrown overboard, most spokesmen for the industry agree that f.o.b. mill pricing would be the only feasible alternative.

Steel producers now are putting

JEEP FAMILY: From the engineering, production and administrative brains of Willys-Overland in Toledo has emerged the line of utility vehicles drawn up here in dress parade. Newest of the group, and still not in production, are the two at the extreme right. One is an all-steel station sedan with 6-cylinder engine; the other a light-weight convertible-type passenger car designed "to meet the needs of the Youth of America." In the center is the conventional jeep; behind it are three light models; at the left are the station wagon and fire truck.

The expanded line of vehicles was demonstrated to 450 industrialists, government officials and publishers last week on the occasion of the second annual institutional day arranged by Willys-Overland. Highlights of the day were an inspection of the company's new $5 million stamping shop, paint shop, 6-cylinder motor line and refurbished forge shop; an address by D. G. Roos, engineering vice president, who explained the W-O product philosophy (see also p. 73), and an examination of some new three-dimensional dynamic graphics developed by James D. Mooney, president, to present a graphic representation of basic economic truths. The latter were featured by a new "break-even" machine which, by flowing colored liquid through a series of cylinders, showed where the gross income of a business goes before it can earn a profit

the finishing touches to their defense case and will file an answer to the FTC complaint by Nov. 1.

Tests Consumer Reaction — The warm air heating industry was polled to test the reaction of steel users to steel pricing systems—past, present and proposed—because the industry is widely distributed geographically, comprises a large number of small and medium size manufacturers who use a variety of the lighter steel products, especially sheets of various types, strip, bars, angles and tubing. The preponderance of replies in favor of the present setup and the comments accompanying their replies indicate they fear disruption of the multiple basing point system would bring dislocations and confusion to their industry.

First Question — "What do you think of the present basing point pricing system in steel?" Typical replies follow:

"We approve the present basing point pricing system. It provides manufacturers in all the basing point centers with steel at about the same price. This decentralizes industry. Steel producers, we believe, have about completed shifts in their facilities to enable them to serve their respective markets at economical costs for freight computed upon these basing points."

"It is our firm conviction that the present basing point system should be maintained. We believe it to be the only method by which manufacturers throughout the country can be on a competitive basis, and certainly the steel industry has prospered under this system, so the matter of freight absorption is not well founded. Then, too, we happen to be situated in the Midwest, and there is not sufficient producing capacity to take care of the demand even in normal times."

"We feel the present system is about as equitable as can be worked out by the steel mills using their own judgment and keeping in mind the security given to them by this system against possible loss."

"I believe that the present basing point method is the most practical for the industry. It eliminates the necessity of being located directly in a steel area in order to be able to enjoy a competitive price."

In opposition to the present system, was this comment: "In our opinion, the present basing point system is completely indefensible and will soon collapse under its own weight." This manufacturer suggested a zone delivered price schedule would be the most workable and practical system.

Second Question — "Do you think f.o.b. mill pricing more advantageous than the present multiple basing point system?" Typical replies:

"We do not favor a strictly f.o.b. mill pricing system as such a system would automatically concentrate all steel fabricating in the immediate vicinity of the mills. From an overall standpoint, it is generally admitted that steel fabricating is already too highly concentrated in the east of Chicago area."

"Although the f.o.b. mill price would be more advantageous to my particular company, I believe it generally is better to have the multiple basing point system."

"We do not favor f.o.b. mill pricing. This would put us in a very serious competitive situation with manufacturers who are close to eastern producing areas. In view of the abnormal situation now prevailing and the gray market in steel, we would not be adverse to absorbing freight at this time. However, the burden would be too great under normal conditions."

"Such a pricing practice (f.o.b. mill) would force both producer and consumer nearest to each other to do business with each other. Order books of mills would certainly become unbalanced on the various products which they could produce, and mills at slight freight disadvantage would be unable to make concessions to obtain needed tonnage."

Several companies pointed out that they are located near large producing areas, and that f.o.b. mill pricing would be to their advantage, yet charitably pointed out that this system would place their competitors, farther away from the mills, at a competitive disadvantage.

Third Question — "Do you favor a return to Pittsburgh Plus pricing?" To this, most answers were a definite "no," without further comment. One furnace manufacturer said, "Pittsburgh base might be considered satisfactory during this tight period of steel supply but would be costly dur-

ing normal periods to western or mid-western manufacturers who today have the advantage of close basing points."

Fourth Question — "If f.o.b. mill pricing is forced upon the steel industry, how will it affect you? Will your steel sources be restricted or enlarged? Will it increase or lower your steel costs?"

More than 90 per cent of the companies answering said f.o.b. mill pricing would increase their steel costs. The remainder pointed out that they were located in or near producing centers and that they would enjoy some decrease, provided they bought from the nearby mills.

A majority believe f.o.b. mill pricing would restrict their sources of supply and that they would be forced to do business with the mills nearest them.

Hit Withdrawals — Many of the manufacturers complained rather bitterly about the withdrawal of some steel producers from areas far removed from their mills. Says one company: "We feel that the producers who withdrew from this territory should immediately reconsider this action. We feel it was most unfair to shut off loyal customers in such a critical period as this, leaving us to ask help from mills which owe us no consideration because of no previous relationship."

Another believes the steel producers are "taking a very small viewpoint when they withdraw from a territory on account of a freight differential. This is one thing that has made it very difficult for us the past two years and we sincerely think that the steel companies should cooperate if they want the present pricing system to endure."

Portsmouth Steel's Wire Capacity Being Doubled

Portsmouth Steel Corp., Portsmouth, O., will have capacity for production of 22,000 to 25,000 tons of wire and wire products monthly when the current $2,500,000 expansion program is completed. Capacity was 12,000 tons when the plant was acquired from Wheeling Steel Corp., July 1, 1946. Ten of 26 high speed wire drawing machines will arrive within 30 days, according to Elmer A. Schwartz, president, and the balance by June 1, 1948.

Open hearth capacity has been increased from 616,000 to over 700,000 tons annually. New equipment added includes a continuous cleaning line, galvanizing units and annealing and patenting furnaces.

Efforts Renewed To Boost Car Output to 10,000 Units Monthly

LAG in the nation's railroad freight car building program continues to inspire analytical attention to the car production problem in an effort to break the rail transportation bottleneck.

Among the latest attacks on the problem was the effort last week of Sen. Clyde M. Reed (Rep., Kans.) to get car building companies to work out a six-month program under which various car makers would guarantee production of a certain number of cars a month. Senator Reed suggested the car builders set up a task committee, which would co-ordinate the program.

Senator Reed absolved the steel companies of all blame for failure to attain the 10,000-cars-a-month goal set last February. He said the steel companies have given "a good performance" in delivering steel and have assured him they are ready to continue supplying steel to build 10,000 cars a month.

Senator Reed reported a meeting last week of steel companies and freight car builders developed that steel which has been supplied for 10,000 cars a month has been partially diverted by the car makers into other products they manufacture.

Looking at the long-range aspect of car requirements, Cleve H. Pomeroy, president, National Malleable & Steel Castings Co., Cleveland, said last week that American railroads will need at least 60,000 new freight cars a year for the next five years.

Continuing his attention to the controversial question of who is to blame for the lag in freight car building, S. M. Felton, president, American Railway Car Institute, said recently, "the truth of the matter is the car builders have been plagued by much the same reconversion problems that have hit other industries. The only difference is that the plight of the car builders has received more than its share of the spotlight."

Present, Past and Pending

■ BETHLEHEM VICE PRESIDENT TO RETIRE

BETHLEHEM, PA.—Quincy Bent, vice president in charge of steel division operations, Bethlehem Steel Co., will retire Nov. 1. He will be succeeded by S. J. Cort, general manager of the company's plant at Sparrows Point, Md.

■ STAINLESS-CLAD BUMPERS TO ADORN 1948 CARS

WASHINGTON, PA.—Automobile bumpers made from Jessop stainless-clad steel will be used on 1948 models of cars and trucks manufactured by two of the larger automobile companies, according to Jessop Steel Co.

■ GRAY IRON FOUNDERS LAUNCH PROGRAM

CLEVELAND—Gray Iron Founders' Society has authorized a long-range program of industrial improvement which includes sustained business paper advertising, organization of 40 local groups of gray iron foundry executives, a balanced technical development program and more extensive public relations activity.

■ ROYAL TYPEWRITER SALES AT ALL-TIME HIGH

NEW YORK—Production and sales of Royal typewriters for the year ended July 31 were the highest in the company's history, sales totaling $35,620,000, compared with $19,242,000 in the previous year.

■ TUCKER FRANCHISES AMOUNT TO $7,773,140

CHICAGO—Tucker Corp. announces that sales of franchises to 73 distributors and 1026 dealers through Sept. 30 totaled $7,773,140.

■ REGIONAL FREIGHT RATE HEARINGS SCHEDULED

WASHINGTON—Interstate Commerce Commission has scheduled seven regional hearings on railroads' petitions for a 27 per cent general freight rate increase, prior to the final hearing in Washington, Dec. 8. Regional hearings are as follows: Chicago, Nov. 3; Montgomery, Ala., Nov. 17; Salt Lake City, Nov. 17; Los Angeles, Nov. 21; Ft. Worth, Tex., Nov. 24; Boston, Nov. 24; Portland, Oreg., Nov. 28.

Prepare Now for Return of Buyers' Market, Porcelain Enamelers Told

Industry expects widespread expansion when steel supplies again become adequate. Construction to become increasingly important market. Enamelers advised to watch for competition from aluminum, plastics, stainless and synthetic finishes

C. D. CLAWSON

PREPAREDNESS for the return of a buyers' market was urged upon more than 125 members of the porcelain enameling industry at a sales and management conference in Cleveland Oct. 10. The conference was held in conjunction with the sixteenth annual meeting of the Porcelain Enamel Institute Oct. 9.

Enamelers were urged to take out adequate sales insurance through market development and sales promotion activities by R. A. Dadisman, manager of market development for American Rolling Mill Co., Middletown, O., and chairman of the institute's market development committee.

Admitting that the present steel shortage is limiting the production of the porcelain enamel industry at present, Mr. Dadisman predicted that the whole steel supply picture would change radically within one year, if production were not further interrupted by strikes.

Mr. Dadisman suggested that during the steel shortage the porcelain enamelers would do well to seek business in fields where porcelain enamel is not yet widely accepted but where it could be used to advantage. Home freezers and some coin-operated machines were given as possibilities.

The return of a buyers' market will bring an increase in competition from other materials, Mr. Dadisman warned. Among these are aluminum, already being used for household washers, refrigerators, dishwashers, ranges and other appliances, plastic materials, stainless steel and the synthetic finishes. The synthetic finishes, he pointed out, not only have been improved, but the steel industry now is offering steel sheets which are bonderized and galvanized to withstand forming operations.

Consensus of those attending the conference was that porcelain enamel holds great potentialities for expansion. One of the big markets of the future is expected to be in construction applications. Roger Allen, Detroit architect, said porcelain enamel holds definite advantages over competing materials in plasticity (adaptability to design), performance and is fairly competitive in price.

Other speakers from the metalworking field who addressed the conference included: Floyd C. Woeslagle, market development division, Carnegie-Illinois Steel Corp.; D. C. Hunter, Enameled Utensil Manufacturers Council; A. M. Sweeney, General Electric Co., and Paul R. Fritsch, Goodyear Tire & Rubber Co.

C. D. Clawson, Ferro Enamel Corp., Cleveland, was elected president of the institute for 1947-48. Other officers named included: Vice presidents —Herbert R. Spencer, Erie Enameling Co., Erie, Pa.; Edward L. Seasholtz, J. M. Seasholtz & Sons Co., Reading, Pa.; R. J. Ritchey, Carnegie-Illinois Steel Corp., Pittsburgh; J. H. E. McMillan, Ingram-Richardson Mfg. Co.; and J. T. Penton, California Metal Enameling Co., Los Angeles. P. B. McBride, Porcelain Metals Corp. of Louisville, Ky., was elected treasurer, succeeding William Hogenson, Chicago Vitreous Enamel Products Co., Chicago, who asked to be relieved after serving the institute for 17 years. Edward MacKasek will continue as secretary and managing director.

Lack of Controversy Minimizes Labor Union Interest in Industrial Safety Programs

THREE sections of the National Safety Council, Metals, Automotive and Machine Shop, and Power Press, figured prominently in the 35th National Safety Congress in Chicago, Oct. 6-10. Each conducted meetings extending over several days.

In the exposition held concurrently with the congress, almost 150 companies exhibited their products, featuring equipment and latest developments in the industrial safety field.

Like Political Organizations—Labor unions are a lot like political organizations—their continued existence is largely dependent upon nurtured controversy, asserted Fred M. Gillies, works manager, Inland Steel Co., East Chicago, Ind., addressing a luncheon of the Metals Section. Because management agrees that safety is important to industrial efficiency there is no controversy with the unions, he said, and this has minimized the interest of organized labor in accident prevention.

Asks Co-operation — Management should continue to provide safe working conditions, he said, but he called for more co-operation from labor in the matter of safety education, observance of safety regulations and in enforcement of sanctions.

The supervisor should be the key man in any safety program, declared H. H. Feit, superintendent of industrial relations, Homestead District Works, Carnegie-Illinois Steel Corp., Munhall, Pa. He proposed a single objective plan in which the supervisor "must not dissipate his efforts in generalities; he must concentrate on specific objectives."

He explained it is the duty of the supervisor to know each job under his supervision, thoroughly instruct each employee in his charge in the safe and proper way to do his job and then see that the correct procedure is followed. He recommended the "single objective" plan for safety as a company-wide function in which continuing accident reports indicate some hazard which needs particular attention. As an example, he cited numerous cases of heat sickness among workers of his company in 1942. A concentrated effort by all concerned reduced the number of victims by 89.2 per cent in the following four years.

Concentrate on Individual—"It is the individual," Mr. Feit declared, "toward whom we must direct our attention from the standpoint of safety. We must increasingly concern ourselves with what he does if we

are to determine why it is that accidents still occur. Such a problem cannot be solved unless there is a definite and conscientious effort made on the part of all management through the front line supervisor to get at the source of the trouble.

Value of demonstrations as an aid in safety education was stressed by E. H. Houck, superintendent of safety and welfare, Aliquippa Works, Jones & Laughlin Steel Corp.

Addressing the Automotive and Machine Shop Section, D. T. Mould, safety director, General Motors Corp., Detroit, and E. G. Bowman, design and development department, General Motors Institute, Detroit, proposed a comprehensive training program for workers as an accident prevention measure and pointed to the record of General Motors Corp. as an example of the value of such a procedure. They explained that the accident frequency for the first six months of 1946 was 4.06 and the severity 0.421—the latter an all-time low for the corporation.

Safe Handling — Extreme care must be used to prevent accidents in the handling of liquid chemical solvents, cautioned E. C. Barnes, industrial hygiene engineer, Westinghouse Electric Corp., East Pittsburgh, Pa. He pointed out there are some 200 different organic solvents now available, and these are constantly being increased. This calls for continual experimentation to determine the proper and safe way of handling them.

Ned H. Dearborn was re-elected president of the National safety Council, 20 N. Wacker Dr., Chicago. He will continue his work as administrative head of the staff in addition to his duties as president. Cleo F. Craig, vice president, American Telephone & Telegraph Co., New York, was re-elected chairman of the board. George A. Jacoby, director of personnel services, General Motors Corp., was named vice president for industry.

Frank W. Kelsey, manager of safety and welfare, Jones & Laughlin Steel Corp., Pittsburgh, was elected general chairman of the Metals Section, to succeed J. L. Ridinger, safety director, Inland Steel Co., East Chicago, Ind. J. E. Moore, vice president, Corporate Service Inc., Detroit, is the new general chairman of the Automotive and Machine Shop Section, replacing J. W. Young, supervisor of safety, International Harvester Co., Chicago. New general chairman of the Power Press Section is George W. Greenwood, safety director, Western Electric Co. Inc., Chicago, succeeding E. C. Woodward, safety director, A. O. Smith Corp., Milwaukee.

Sheet Distributors Told 1947 Output To Set New Record at 17 Million Tons

Aluminum sheets gaining as result of scarcity of steel; may hold in some applications. Distributors deplore establishment of fabricating subsidiaries by steel producers. Tax on co-operatives urged

MORE than 17 million tons of steel sheet and strip in 1947. While short of the needs of steel hungry metalworking companies, this figure is more than 3 million tons greater than last year's production and exceeds the previous high of 1941 by more than one million tons.

This is the picture of flat-rolled steel supply, based on the latest estimates, given to the National Association of Sheet Metal Distributors in Atlantic City, N. J., last week by Bennett S. Chapple Jr., assistant vice president, United States Steel Corp. The meeting was the 37th semiannual gathering of the sheet metal distributors and was held in conjunction with the 53rd annual meeting of the National Wholesale Hardware Association, Oct. 13-16.

Emphasizing that steel producers were doing all reasonably within their power to bring supply into balance with demand, Mr. Chapple declared expansion now under way will eventually lead to a capacity of 19 million tons of sheets and strips. Original plans, he said, called for most of these facilities to be in operation by the end of this year, with some early this year; however, various difficulties, particularly those of obtaining electrical equipment made this impossible. Work in progress, he added, is at a cost two to three times greater than that upon which most of the industry's facilities are being depreciated.

Fabricating Subsidiaries Hit — Increasing tendency among steel producers to set up subsidiaries for fabrication of manufactured products was deplored by the distributors. It was suggested they must do all in their power to increase effectiveness of their distribution to combat this.

Various trade matters came up for discussion, such as costs; salesman compensation; cash, discount terms, with a growing swing back to the 2 per cent cash discount being generally hailed; and the increasing threat of co-operatives, with major unions falling behind the movement and with distributors urging "proper taxation" of co-operatives as one means of checking their encroachment.

Aluminum Gains — Aluminum sheets were reported meeting with good acceptance for various purposes. Some distributors believe aluminum is making such good progress that galvanized sheet producers are going to have trouble getting their markets back in some lines once conditions return to normal. Much research is going ahead, it was pointed out, and the cost trend is downward, and as this continues, new uses open up. A show of hands at one session indicated that few present were not handling aluminum sheets.

W. T. Ingram, manager, Distributor Division, Reynolds Metals Co., Louisville, Ky., said his company's backlogs are mounting rapidly, and that, while business in the distributor field would probably drop off 25 to 30 per cent once "steel comes back," he is bullish on the long-range potential of aluminum.

NASMD OFFICERS

John P. Speck, Tiffin Art Metal Co., Tiffin, O., was elected president of the National Association of Sheet Metal Distributors, succeeding A. M. Vorys, Vorys Bros. Inc., Columbus, O. Ray P. Farrington, Potts-Farrington Co., Philadelphia, was named first vice president; P. M. McKenney, Conklin Tin Plate & Metal Co., Atlanta, second vice president; T. A. Fernley Jr., executive secretary; and R. C. Fernley, secretary-treasurer.

Executive committee is comprised of Joseph F. Stumpf, York Corrugating Co., Jersey City, N. J., and Roger K. Becker, Ohio Valley Hardware & Roofing Co., Evansville, Ind., 1947-50; William H. Bowe, Herrick Co., Boston, and Lee J. Haines, Souther Iron Co., St. Louis, 1946-49; and William A. Vernier, Superior Safety Furnace Pipe Co., Detroit and Alexander Thomson, Tenner & Co., 1945-1948.

Cut in Pig Iron Production Seen At Turn of Year

Termination of government's premium price program Dec. 31 may adversely affect high-cost producers

WASHINGTON

PIG IRON production, even now insufficient to meet all demands, is expected to undergo some reduction after the turn of the year due to termination of the Housing Expediter's premium production program on Dec. 31.

At present 17 companies are participants in the program; they receive a premium for that portion of their production which goes directly into products needed in housing. While most of the tonnage turned out by these producers does not qualify for premium payments, the premium payments go toward meeting high costs and in a number of cases are necessary to keep furnaces in operation.

Premiums Are Substantial — The premiums are substantial. Where a blast furnace had been in operation at the time the owning company enrolled in the housing expediter's premium plan the premium payment for qualifying iron is $8 a ton. Where an operator has agreed to blow in a furnace for the purpose of participating in the plan the premium is $12 a ton. The premium payments in many cases represent the difference between operating at a profit and a loss.

The reduced staff in the housing expediter's office has not undertaken to maintain continuous statistics on the results obtained under the premium plan. It is leaving that task until after the plan expires on Dec. 31. After that it will compile a report for Congress and the public.

Some Statistics Available — However, statistics on production in March and July of this year are partially available—and they show that premiums have been paid for a production fluctuating between 600,000 and 900,000 tons of pig iron annually. They further show that the total pig iron production of the participating companies is approximately 3,200,000 tons annually.

In other words, premiums are paid on approximately 25 per cent of the pig iron of the participating operators. The question raised, therefore, is: To what extent does the premium tail wag the blast furnace dog? In other words, how much will the 3,200,000-ton annual output of the participating producers shrink following termination of the premium arrangement on Dec. 31?

To this question nobody in Washington has even an approximate answer. Opinion in some quarters is that ending of the premium arrangement may cause a loss of more than 1 million tons of pig iron a year.

Congress Hopeful — Joint Congressional Committee on Housing is hopeful that expiration of the pig iron premium plan will not cause any loss in pig iron production. It was pointed out to STEEL last week by Sen. Joseph R. McCarthy (Rep., Wis.), vice chairman of the committee, that the War Assets Administration is working to get into early operation four furnaces whose output to a large extent will go into cast iron pipe and other essential housing items.

One is the government-owned stack at Gadsden, Ala., operated by Republic Steel Corp., on which a rebuilding contract is under negotiation with Arthur G. McKee & Co. Another is the Lone Star furnace, Daingerfield, Tex., slated to go into blast by the end of October. The third is the government-owned furnace at Monessen, Pa., which requires installation of turbo blowers and some other equipment, and for which an operator is sought. The fourth is the government-owned furnace at Ironton, Utah, where lack of suitable coal is the delaying factor.

FOR WANT OF A NAIL

Not much has been said about it, but the nail shortage is so serious it promises to break into the headlines any day now. Last week Sen. Joseph R. McCarthy (Rep., Wis.) told representatives of four large producers the nail shortage is seriously hindering essential house construction. He wants the industry to do something to remedy the situation, either through increased production or better distribution.

With a view to developing a plan of action Senator McCarthy has invited 15 nail producing companies to meet with his committee at Hotel Jefferson, St. Louis, Oct. 24. The senator hopes it will not be necessary for his joint congressional committee to recommend remedial legislation.

Steel Production Rises 32% Above 1946 Rate

Production of steel in the first nine months of 1947, totaling 62,611,051 tons, was about 32 per cent greater than in the like 1946 period and was only 6 per cent short of the amount produced in the entire year 1940, record peacetime year, according to the American Iron & Steel Institute. Total production in 1940 was 66,982,686 tons.

Steel operating rate during the first three quarters of 1947 averaged 91.7 per cent of capacity compared with only 69 per cent in the like 1946 period.

September, 1947, output at 6,775,158 net tons fell below the August total of 6,982,086 tons, with the decline attributed to the shorter month and a strike affecting a railroad serving steel plants. The calculated weekly production was 1,582,981 tons in September compared with 1,576,092 tons in August.

The third quarter output of 20,327,398 tons compared with 21,340,859 tons in the second quarter and 20,942,794 tons in the first three months of the year. In the third quarter of 1946, output totaled 20,098,771 tons.

STEEL INGOT PRODUCTION STATISTICS

	Estimated Production—All Companies								*Calculated weekly production all companies	Number of weeks
	—Open Hearth—		—Bessemer—		—Electric—		—Total—			
1947	*Net tons	Per cent of capac.	Net tons	Per cent of capac.	*Net tons	Per cent of capac.	*Net tons	Per cent of capac.	Net tons	in mo.
Jan. ...	6,544,841	95.1	384,096	87.7	284,309	65.9	7,213,246	93.0	1,628,272	4.43
Feb. ...	5,830,371	93.8	314,912	79.6	276,779	71.1	6,422,062	91.7	1,605,515	4.00
Mar. ...	6,614,369	96.1	378,893	86.5	314,224	72.9	7,307,486	94.3	1,649,545	4.43
1st qtr..	18,989,581	95.0	1,077,901	84.8	875,312	69.9	20,942,794	93.1	1,628,522	12.86
Apr. ...	6,360,000	95.4	375,675	88.6	306,422	73.4	7,042,697	93.8	1,641,654	4.29
May ...	6,634,716	96.4	372,878	85.2	321,903	74.6	7,329,497	94.5	1,654,514	4.43
June ...	6,312,674	94.7	351,247	82.8	304,744	73.0	6,968,665	92.8	1,624,397	4.29
2nd qtr..	19,307,990	95.5	1,099,800	85.5	933,069	73.7	21,340,859	93.7	1,640,343	13.01
1st 6 mos...	38,297,571	95.3	2,177,701	85.2	1,808,381	71.8	42,283,653	93.4	1,634,467	25.87
July ...	6,028,707	87.8	256,125	58.6	285,322	66.3	6,570,154	84.9	1,486,460	4.42
*Aug. ..	6,324,456	91.9	346,033	79.0	311,597	72.2	6,982,086	90.1	1,576,092	4.43
†Sept. ..	6,136,845	92.3	334,425	79.0	303,888	72.9	6,775,158	90.5	1,582,981	4.28
†3rd qtr.	18,490,008	90.6	936,583	72.2	900,807	70.5	20,327,398	88.5	1,548,164	13.13

* Revised. † Preliminary figures subject to revision.

For 1947, percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of Jan. 1, 1947, as follows: Open hearth 81,010,990 net tons, bessemer 5,154,000 net tons, electric 5,076,240 net tons, total 91,241,230 net tons.

SHIPMENTS OF FINISHED STEEL PRODUCTS FOR AUGUST AND YEAR TO DATE

(All Grades Including Alloy and Stainless)

Steel Products	Number of companies	Items	AUGUST - 1947			To Date This Year			Whole Year 1946		
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	41	1	308,751	5.8	152,348	* 1,939,224	4.7	* 1,426,130	1,949,624	4.0	1,645,748
Structural shapes (heavy)	13	2	371,239	7.0	26	* 2,954,335	7.1	1,964	3,474,284	7.1	5,399
Steel piling	4	3	28,005	0.5	-	* 215,802	0.5	23	205,313	0.4	141
Plates (sheared and universal)	29	4	539,817	10.2	22,223	* 4,157,630	10.0	146,350	4,152,181	8.5	250,709
Skelp	7	5	17,044	0.3	31,278	109,810	0.3	254,861	227,033	0.5	194,666
Rails—Standard (over 60 lbs.)	4	6	172,226	3.3	-	1,466,278	3.5	652	1,790,311	3.7	4,890
—All other	5	7	17,629	0.3	-	136,146	0.3	267	144,999	0.3	426
Joint bars	7	8	14,434	0.3	1,234	121,096	0.3	10,249	176,803	0.4	5,327
Tie plates	9	9	41,828	0.8	296	* 339,073	0.8	3,681	447,496	0.9	18,700
Track spikes	8	10	12,443	0.2	-	115,396	0.3	74	146,194	0.3	693
Hot Rolled Bars—Carbon	33	11	533,514	10.1	47,795	* 4,193,422	10.1	501,805	5,006,859	10.3	707,991
—Reinforcing—New billet	16	12	118,510	2.2	1,046	* 838,168	2.0	6,520	1,048,483	2.1	7,381
—Rerolled	11	13	13,013	0.3	-	107,087	0.3	-	141,346	0.3	1,267
—Alloy	27	14	134,186	2.5	16,820	1,173,992	2.8	144,412	1,390,278	2.8	138,395
—Total	45	15	799,223	15.1	65,661	*6,312,669	15.2	652,737	7,586,966	15.5	855,034
Cold Finished Bars—Carbon	29	16	105,946	2.0	768	1,003,006	2.4	6,131	1,316,579	2.7	2,428
—Alloy	26	17	15,522	0.3	314	157,769	0.4	1,427	196,237	0.4	1,725
—Total	35	18	121,468	2.3	1,082	1,160,775	2.8	7,558	1,512,816	3.1	4,153
Tool steel bars	19	19	6,194	0.1	173	* 61,797	0.1	* 1,023	96,020	0.2	371
Pipe & Tubes—Butt weld	15	20	146,324	2.8	6,386	1,108,619	2.7	44,586	1,276,289	2.6	45,393
—Lap weld	8	21	36,455	0.7	22	264,740	0.6	701	305,516	0.6	238
—Electric weld	11	22	103,807	2.0	101	699,701	1.7	1,114	674,459	1.4	591
—Seamless	10	23	162,506	3.1	10,460	1,372,907	3.3	92,146	1,871,540	3.8	83,441
—Conduit	7	24	14,190	0.3	664	98,068	0.2	5,541	98,521	0.2	2,448
—Mechanical and pressure tubing	13	25	53,259	1.0	1,813	433,446	1.0	13,644	429,180	0.9	3,478
Wire rods	22	26	58,750	1.1	28,359	436,284	1.1	217,059	679,998	1.4	346,506
Wire—Drawn	39	27	208,966	4.0	15,308	* 1,675,526	4.0	120,473	1,933,124	4.0	135,592
—Nails and staples	18	28	60,939	1.2	759	544,059	1.3	5,521	636,632	1.3	797
—Barbed and twisted	15	29	21,709	0.4	22	165,372	0.4	58	207,610	0.4	-
—Woven wire fence	13	30	35,290	0.6	336	270,723	0.7	2,461	383,230	0.8	-
—Bale ties	12	31	9,533	0.2	-	81,078	0.2	-	99,993	0.2	-
Black Plate—Ordinary	9	32	63,902	1.2	122	541,347	1.3	1,732	781,167	1.6	3,179
—Chemically treated	8	33	818	-	-	16,401	-	-	125,170	0.3	-
Tin and Terne Plate—Hot dipped	9	34	194,370	3.7	-	1,346,183	3.3	228	1,924,657	3.9	-
—Electrolytic	9	35	141,951	2.7	-	1,014,679	2.5	529	909,173	1.9	-
Sheets—Hot rolled	30	36	578,390	11.0	43,435	*4,736,725	11.4	387,393	5,521,463	11.3	421,198
—Cold rolled	17	37	437,494	8.3	2,991	*3,574,858	8.6	17,481	4,075,554	8.4	3,397
—Galvanized	16	38	133,711	2.5	112	*1,057,017	2.6	326	1,462,053	3.0	1,725
—Electrical and enameling	10	39	49,096	0.9	-	382,470	0.9	385	435,170	0.9	-
Strip—Hot rolled	23	40	135,294	2.6	28,565	*1,149,907	2.8	194,469	1,363,812	2.8	237,176
—Cold rolled	34	41	135,862	2.6	2,240	*1,064,815	2.6	18,794	1,282,146	2.6	25,904
Wheels (car, rolled steel)	2	42	29,986	0.6	-	241,698	0.6	2	252,308	0.5	348
Axles	5	43	17,320	0.3	-	121,114	0.3	53	130,461	0.3	221
All other	-	44	-	-	-	-	-	-	6,266	-	-
TOTAL STEEL PRODUCTS	141	45	5,278,223	100.0	416,016	* 41,487,768	100.0	*3,630,275	48,775,532	100.0	4,297,889

* Adjusted. Report from American Iron & Steel Institute.

Record Peacetime Shipments of Steel to Fabricators Indicated

BARRING unexpected interruptions in production over the remainder of this year, shipments of steel products to consumers will set a new peacetime record in 1947. Based on data for the first eight months, year's movement of steel should top 62 million tons.

Total shipments of finished and semifinished steel in August increased 300,000 tons over the July total, according to the American Iron & Steel Institute. August shipments totaled 5,278,223 net tons, compared with the July shipments of 4,974,566 net tons.

Peacetime Record—Total shipments for the first eight months of 1947 amounted to 41,487,768 tons, indicating likelihood of a new yearly peacetime record of over 62 million net tons.

August shipments of sheet and strip steel totaled 1,469,847 net tons, making an increase of 41,053 tons over July shipments of 1,428,794 net tons. This brought total shipments for the first eight months of 1947 up to 11,965,792 net tons, indicating probable record shipments of around 18 million tons for the current year.

Pipe Shipments Rise—August shipments of all types of pipe and tubing totaled 516,541 net tons, which was a gain of about 37,000 tons over the July shipments of 479,713 net tons. Shipments through the first eight months of 1947 totaled 3,977,481 net tons, indicating that about 6 million tons of such products would be shipped during the current year, which would be close to the 1944 wartime record year.

The rate of finished steel shipments during the first eight months of 1947 was approximately 5,180,000 net tons monthly, only 1.7 per cent below the 1944 record monthly rate of 5,271,000 tons.

National Founders Meet In New York, Nov. 6-7

An analysis and examination of many aspects of labor relations will highlight the annual meeting of National Founders Association at the Waldorf-Astoria Hotel, New York, next Nov. 6 and 7.

Among those speaking on this topic will be Rep. Fred A. Hartley (Rep., N. J.) who discusses "The Purpose of the Labor-Management Relations Act" and Copeland Gray of National Labor Relations Board who outlines "New Angles in Labor Relations."

Other speakers include Sen. Homer Capehart (Rep., Ind.) whose topic will be "Business and Government" and James H. Smith of General Motors Corp. who discusses "Foundry Administration and Education."

JANMAT Takes Major Portion Of Surplus Tools

Withdrawals to reserves plus speeded up disposals spur hopes for eliminating WAA's machine tool inventory

DISPOSAL techniques by which the War Assets Administration inventory of machine tools in the Detroit region was reduced from 22,000 on July 1 to 4000 on Oct. 10 will be applied throughout the country by the agency's staffs.

By using the same methods elsewhere, they hope to reduce their inventory of presently held machine tools to a total of 18,000 by the end of the year. This compares with 122,000 in stock on July 1 and 96,000 on Sept. 1.

The biggest single factor in reducing the Detroit inventory was the action of the Joint Army-Navy Machine Tool Committee in moving large numbers of the tools into storage in order that they may be instantly available for war production. However, intensive efforts in other directions helped signally. During July and August the Detroit office got rid of 10,500 tools in sales to priority claimants, in sales to the public at large, and by donations to institutions in need of them. Then, in September, JANMAT began a review of the remaining 11,500 tools, with the result that by Oct. 10, when it completed its work at Detroit, it had placed orders for 7500 tools to go into its reserve.

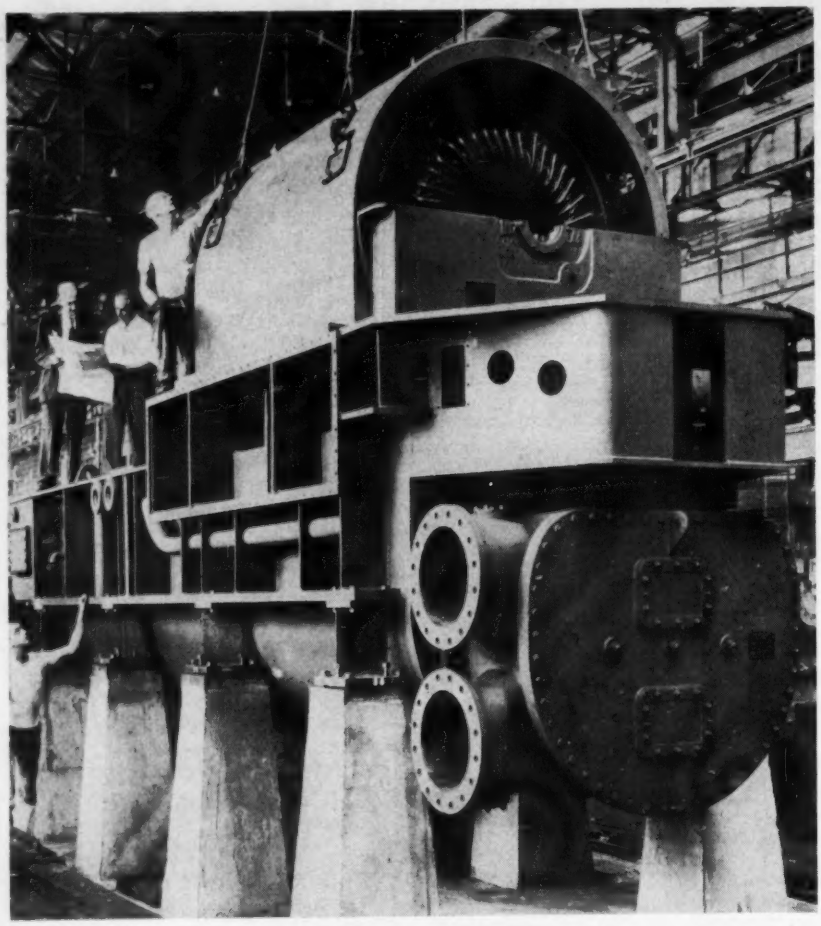
Scrapping Final Resort — Now WAA officials are reviewing the 4000 tools left in the Detroit region. They are mostly dregs for which there is no present demand, tools that are in poor condition, or tools that are overage or otherwise not desirable. There are practically no standard, general-purpose tools left. Most of the 4000 tools will be sold by competitive bids for their scrap or salvage value. But WAA Chief Robert M. Littlejohn has ordered that they be gone over intensively so as to screen out any remaining tools that can be used for productive purposes. It is expected that this job will have been completed in plenty of time to permit final liquidation of all the 4000 remaining tools by the end of November.

While WAA officials have set June 30, 1948, as the final date for winding up all surplus property disposal, and while they have been hoping to clean up the remaining machine tool disposal job pretty close to next Mar. 31, it may be that the machine tool program will have passed into history before this latter date. This is because JANMAT now is taking the bulk of new offerings. Under the policy laid down by General Littlejohn, and started on Oct. 1, JANMAT gets first crack at all new offerings.

Additions Still Coming—The WAA machine tool inventory will sustain some further accretions. There still are some 120 surplus war plants that contain machine tools, and a part of the machine tool equipment in these plants will not be desired by purchasers of the plants, but will have to be sold separately. There is no means of knowing how many more tools will be put on the market in this way.

But WAA officials say that the big machine tool disposal job has been done. From now on the sale of surplus machine tools will fade out rapidly as a deterrent to the sale of new tools by the machine tool builders. With JANMAT now getting first crack at new offerings and skimming off all but 10 to 20 per cent, there will be very little cream left for other potential takers.

Incidentally, there now is no limit to the number of machine tools which the JANMAT Committee may place in storage for future war purposes. Under the law passed by Congress in July, the Bureau of the Budget gave permission to the JANMAT Committee to divert up to 92,000 machine tools into its reserve. Under recent policy rulings, the JANMAT Committee can obtain Budget certification for any desired additional number of tools; when Congress passed the law it did not set any ceiling on the number of tools to be reserved under the JANMAT program.



"PICKABACK HEART": Workmen assemble the "heart" of a 5000-kilowatt unit power plant, one of four such plants just ordered by Mexico's federal electricity commission from Westinghouse Electric Corp. This is known as a "pickaback" unit because the condenser serves as the base for the turbine, making a compact package that simplifies shipping and construction problems. Normally, the condenser is suspended from the turbine. The unit, which is 17 ft high, occupies a floor area of 13 x 31 ft. NEA photo

GE Apparatus Division Changes Are Announced

General Electric's oldest and largest manufacturing department reorganizes under new administrative setup

GENERAL Electric Co.'s Apparatus Department, largest and oldest manufacturing division of the company, is establishing a new "integrated operating unit form of management to provide for expanded production," according to R. C. Muir, vice president and general manager of the department.

The Apparatus Department manufactures power-producing and power-consuming equipment for industry, utilities and transportation. The new organization consists of separate operating units, each with a manager responsible for all phases of business.

Mr. Muir appointed 15 unit managers and a new works manager for the Ft. Wayne, Ind., works. Managers of Apparatus Department Works in Schenectady, N. Y.; Lynn, Mass.; Erie, Pa.; and Oakland, Calif.; will continue in their present positions. New unit managers at other Apparatus Works will have direct supervision of that works.

The new units, to be known as divisions of the Apparatus Department, and the names of the managers appointed, follow:

At Schenectady: Turbine and Gear Divisions, J. W. Belanger; Control Divisions, K. R. Van Tassel; Large Motor and Generator Divisions, J. M. Crawford; Small and Medium Motor Divisions, W. H. Henry; Aeronautic and Ordnance Systems Divisions, W. C. Heckman; Industrial Heating Divisions, C. L. Ipsen; Lighting Rectifier Divisions, A. F. Dickerson; Wire and Cable Divisions, B. F. Ilsley.

At Ft. Wayne: Fractional-Horsepower Motor Divisions, M. E. Lord; Specialty Transformer and Ballast Divisions, W. C. Wichman.

At West Lynn, Mass.: Meter and Instrument Divisions, N. M. Du Chemin.

At Lynn: Aircraft Gas Turbine Divisions, H. D. Kelsey.

At Pittsfield, Mass.: Transformer and Allied Product Divisions, Robert Paxton.

At Philadelphia: Switchgear Divisions, R. F. Tinnerholm.

At Erie: Locomotive and Car Equipment Divisions, G. W. Wilson.

Mr. Muir named C. H. Matson as manager of the Ft. Wayne Works. Mr. Matson will be responsible for the organization and operation of the service divisions and allied activities.

MIXED STEELS

Production of "mixed steels," a combination of open hearth or converter steel and acid electric furnace steel forming a product of specified analysis and physical properties, was proved feasible during the war at the Hermann Goering Works, Watenstedt, Germany, by Dr. Konrad Hoffman, metallurgist, according to the Office of Technical Services, Department of Commerce.

Mixed alloy steels, of which some 100,000 tons were produced in the German plant, were found to minimize the loss of alloying elements and lower the materials cost by utilizing cheaper materials, such as spiegeleisen and ferrochromium, produced in blast furnaces. The excellent degree of metallurgical cleanliness and satisfactory physical properties of products made with this method compared favorably with corresponding grades of open-hearth and electric furnace steels, the report asserts. Dr. Hoffman believes stainless steel can also be produced in this manner.

Chicago Reports High Prices Despite Better Production

Prices are continuing to rise for Chicago industry although production is better, delivery times are generally faster and order backlogs are diminishing, according to a business survey of the area by the Purchasing Agents Association of Chicago for September as compared with August.

Insufficient time has elapsed, says the survey, for improved production and delivery conditions to exert pressure on prices, and thus far most businesses are taking in stride the higher costs. Buying conditions have also improved, the survey reports, with a majority of firms questioned indicating that they buy for 60-day periods instead of the three-month term which was the most common earlier in the year.

Fuel Oil Supply To Grow Tighter During Winter

Demand expected to be 25 to 35 per cent greater than year ago. Price increases may follow freight rate hike

FUEL oil supply will become much tighter during the next six months, the period in which seasonal demand will reach its peak. Demand will be 25 to 35 per cent greater than a year ago. Production, now touching new highs, cannot be pushed much higher with present facilities.

Prices are expected to advance further, due to the recent increase in freight rates. Fuel oil prices now are about 3 cents a gallon higher than a year ago.

This is the appraisal of the fuel oil outlook given by Rexford S. Blaser, vice president, Allied Oil Co. Inc., Cleveland. He warns that supplies of fuel oil may continue to be light, especially on distillates, for several years. Relief from the shortage will require steel and equipment for additional pipelines, tankers, barges and tank cars.

Currently the petroleum industry is producing a record 5,200,000 barrels of crude oil daily, the equivalent of more than 850,000 tons which must be transported from wells to refineries and thence to distributing outlets. Refineries are running at 93 per cent of capacity and even the most modern units are pressed to maintain this rate.

Consumption has increased sharply over prewar, with a third more petroleum products being used. Distillate consumption is up 67 per cent over 1941. Further increases in consumption are expected in 1948, with all products moving up 5 per cent and distillate at least 25 per cent, according to Bureau of Mines reports.

The sharp increase in demand for distillate is attributed to the widespread installation of stand-by fuel oil equipment following the natural gas shortage, to the dieselization of railroads, expansion in use of fuel oil for home heating, and a steady increase in the mechanization of farm machinery.

A large portion of the oil used in the Midwest must be transported into that area from the Southwest and other major producing districts.

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Acceleration of inflationary trend chief worry at White House following report of Council of Economic Advisers that situation is out of hand. Administration spokesmen admit little can be done to turn tide

BECAUSE of the political angles involved not much is being said about it for publication, but the chief worry at the White House these days is the recent acceleration of the inflationary trend. This situation arose when the Council of Economic Advisers a little over two weeks ago advised the President that "inflation is here and has gotten out of hand." Since then other administration economists have endorsed the findings of Dr. Edwin G. Nourse's group unanimously.

In searching for weapons with which to arrest and turn back the tide of inflation, administration spokesmen admit there is little they can do. In recently appealing to the public and to manufacturers for cooperation in keeping prices down, and in stepping up antitrust action in some lines of business, the administration has pretty well shot its wad.

One control which has potentiality is the provision in the Commodities Exchange Act under which the government could limit daily grain sales. It could go so far, for example, as to decree that not more than one bushel of wheat could be sold per day. Setting of any such limit naturally would do more to kill off harmful grain speculation than the use of such devices as increasing the margin that speculators have to pay. But such handling of the situation might lead to some very distasteful results, and the administration is keeping this weapon in reserve.

Few Wartime Controls—The remains of the once sweeping wartime controls, of course, cannot be used effectually in combating inflation. They cover a very limited number of commodities still under the management of the Commerce Department's Office of Materials Distribution, the control of exports by Commerce's Office of International Trade, modified rent control, and a few others of little significance.

Furthermore, the administration is not prepared to take any different attitude on the next wave of wage demands than it did on the last two occasions. This was indicated by Secretary Schwellenbach when he reminded the American Federation of Labor convention at San Francisco that the cost of living has been rising faster than wages.

Higher Prices Blamed — Higher prices are held responsible for much of the recent expansion in bank loans, due to the need of putting more money in manufacturers' and business inventories generally. The situation, the administration fears, will worsen when the lifting of the Federal Reserve curbs on consumer credit will give a further lift to consumers' purchasing power. Speculation, too, is seen on the increase, and is held responsible for much of the recent expansion in bank investments. For instance, administration economists were expecting a drop in real estate and housing prices this summer. This expectation has not materialized due to willingness of speculative investors to pay the asking prices for housing now that rent ceilings are being moved up.

PERSISTENT

Republican leaders, particularly Chairman Harold Knutson (Minn.) of the House Ways & Means Committee, are studying the 1947 vetoed tax bill with a view to insuring congressional over-riding of a possible 1948 veto. The proposed reductions in the contemplated new measure are the same as in the vetoed H. R. 1, but the bill will be revised with a view to commanding more support in the Senate where six or seven more votes are needed for over-riding.

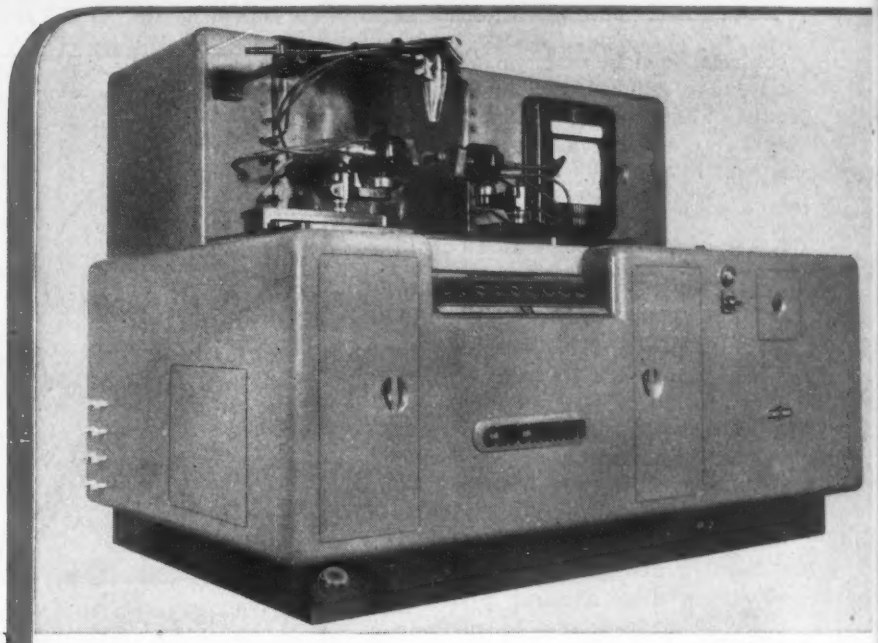
It now is almost certain that the bill will contain a community tax clause under which husbands and wives, irrespective of the state in which they live, may report on a split income basis and thus get into a lower tax bracket. Addition of this one feature is expected to get the needed extra support in the Senate.

Something probably can be expected from the White House, but so far no effective approach on the solution of the problem has been thought of. The food conservation program has not been mentioned publicly as an attempt to drive food prices down, as that would not sound good to farmers. Actually that is an objective, although if the campaign, in the face of stepped-up food buying for Europe, only serves to keep food prices from mounting still higher, the administration will be very well pleased.

Profits Get Attention—Administration attention continues directed at the profits of industry. One report under study dwells on the point that "for the first quarter of 1947 the profits of corporations were more than double those in the first quarter of 1946."

With reference to the Marshall Plan for aid to 16 western European nations, the administration is just as serious as ever but, in view of the gathering support from members of Congress, feels it does not have to over-exert itself to get approval for at least a minimum program. Current expectations are that if a special session is called it will not be set for earlier than Dec. 1. This is indicated by the fact the Senate Foreign Affairs Committee is to begin consideration of the Marshall Plan on Nov. 10 and the Senate Appropriations Committee eight days thereafter. The House Foreign Affairs Committee will convene Nov. 10 on the same subject and House Appropriation Committee may be called a few days later. In the meantime, expressions from members of the Herter Select Committee on Foreign Aid, who returned Oct. 9 after a six-weeks' trip to Europe, indicate that they will support an aid-to-Europe program hedged in by adequate safeguards.

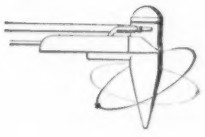
Talk Controls — There has been considerable speculative conversation in Washington as to the possibility of restoring some of the discontinued wartime controls—as control of steel distribution. But the only statements from a responsible quarter are those from Sen. Ralph E. Flanders and members of his congressional price investigating subcommittee. Senator Flanders, speaking for his group, says: "We have not yet found any alternative to some measure of control—at least on the basic item of food." To get a restoration of such



PATENTS PENDING

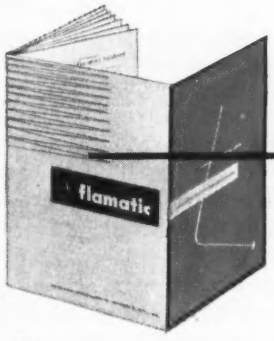
announcing the cincinnati flamatic hardening machine

flamatic



a new flame hardening machine with electronic temperature control . . .

Here, for the first time, is a machine for flame hardening parts in production quantities, that holds metallurgical specifications and dimensional tolerances previously impractical with flame hardening. By means of electronic temperature control, the Flamatic permits rapid heating of surfaces of parts to desired preset temperature, followed by an oil quench . . . Full surface hardness is developed. Heat penetration is controlled within narrow limits. Core properties are left undisturbed and distortion is negligible. Operation is fully automatic except for loading of parts . . . Field-tested in many plants, the Cincinnati Flamatic has proved its extraordinary economy and speed in processing a wide range of gears, pinions, shafts, and similar parts.



Your request for a new complete descriptive catalog—Publication No. M-1611—will be answered promptly. Write.

CINCINNATI

THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO, U.S.A.

controls, even in part, would require a lot more support than now seems to exist. The significant thing is that such an expression has come from a man like Senator Flanders.

Krug Sees No Serious Drain

The United States has the natural resources and the agricultural and industrial capacity to render Marshall Plan aid to Europe without damaging the domestic economy.

This is the gist of a report prepared by Secretary of the Interior Krug, and former chairman of the War Production Board, and submitted at President Truman's request.

Foreign aid will intensify certain shortages over a short period but these difficulties can be minimized by careful programming, screening of demands and channeling of materials. The problems which the United States will face in the future on natural resources and capacity will be with us irrespective of the amount of aid we extend to Europe. They will result from continuing the domestic economy at its present high level of activity. Foreign aid, reported Secretary Krug, will call for only a small fraction of our total demand at most.

Not Enough Steel—Mr. Krug saw the grain problem as a one-year problem, to be eased if Europe has normal crops in 1948, or the corn crop in the United States again approaches normal. A more difficult problem relates to steel supply, said Mr. Krug; there will not be enough steel to take care of all demands. There should be enough steel to meet basic needs at home and in Europe. The report implied the need for reinstituting some sort of control of distribution of steel. The coal problem, said, Mr. Krug, is due to lack of railroad cars primarily, and will be solved when enough cars are available. Difficulties will be encountered, Mr. Krug reported, in sparing nitrogen fertilizers to Europe, and in furnishing certain types of machinery which at present are available only for deferred delivery.

The Harriman Committee, which expects to submit its report by Nov. 1, is not too optimistic about its ability to present a detailed, comprehensive report. For one thing, it does not see its way clear toward getting enough information by Nov. 1 to report accurately on Europe's immediate needs for steel and for agricultural, mining, textile and electrical generating equipment. Recently the Harriman committee staff went into a huddle with a number of participants in the recent Paris conference of 16 western European countries. More will arrive in coming weeks, and several American engineers with wide experience in Europe will be on hand at the same time. But the experience to date is that even the Europeans do not know just what they will require from the United States in the way of steel and machinery on a minimum basis.

SURPLUS SHIPS FURNISH MATERIALS: Dravo Corp., Pittsburgh, is dismantling two surplus LSMs, purchased from the Maritime Commission to obtain scarce materials and equipment for the construction of new high powered river towboats. During the war, Dravo built the first LSMs at its Wilmington, Del., yards

Confer Daily—In the meantime, so that the Congress may have a straight story on what is in prospect—as the prospects become more apparent—the Harriman committee staff confers daily with staff representatives of a number of congressional committees. These are mainly the two foreign relations and the two appropriations committees—also the Herter House Select Committee on Foreign Aid whose members are just starting to return from Europe.

New Security Code Drastic

Uneasiness over the increasingly dangerous international situation has been intensified by the State Department's announcement of its new security code. It is the most drastic ever imposed in the United States in time of peace, and is contrary to the established concept that a man must be held innocent until proved guilty.

In brief, the State Department may discharge any employee regarded as a "security risk," and any doubt as to his loyalty is decided against him. There is no appeal. The code represents the first application of the so-called McCarren rider which gives the secretary of state absolute discretion in the firing of any employee in the national interest.

Covers Wide Area—Not only are communists or fellow travelers to be fired but anyone who has "habitual or close association" with persons believed to be communists. The code also calls for firing of "weak characters" — as persons irresponsible in handling their financial affairs and confidential information, former criminals, sex perverts, alcoholics, etc.

The code is the outgrowth of investigations by a personnel security board established several months ago to pass on loyalty and security cases. Some 100 cases have been considered, resulting so far in 13 firings. The code was found necessary in view of the board's finding that the department has become a "vital target" for spies and subversives.

Reflects Official Temper—The new State Department policy is but a manifestation of a general temper in Washington which seems to assure that the outbreak of hostilities in another shooting war would bring on the setting up of internment camps on a scale large enough to accommodate dangerous communists. The identity and location of the subversive citizens are well known.

How the wind is blowing was quite well demonstrated when some 3000 industrialists recently attended the annual showing of new and improved weapons at the Aberdeen Proving Grounds to the Army Ordnance Association. For the first time military and press representatives of Russia and its satellites were conspicuously absent.

Study Shows Only Two Industry Groups Had Larger War Earnings

Financial performance of 22 major industries in war years analyzed by Federal Trade Commission. Transportation equipment and beverage makers' showing best. Iron and steel experienced gradual decline

FINANCIAL performance during the war years of 4107 United States companies in 22 major manufacturing groups is summarized in a Federal Trade Commission report just issued.

Entitled "Report on Wartime Costs and Profits for Manufacturing Corporations, 1941 to 1945," the 30-page report shows the transportation equipment industry and the beverage making industry were the only groups having higher earnings after payment of federal taxes during the war years than in 1941.

Increase Is Shown—Based upon 1941 as 100 per cent, the transportation equipment industry's net income after federal taxes was 143 per cent in 1942, 157 per cent in 1943, 133 per cent in 1944 and 105 per cent in 1945. The jump in the transportation equipment industry's earnings over those of 1941 was a result, however, of greater gains in volume of net sales than an increase in percentage of net profit (after taxes) per dollar of sales. In fact, net profit (after taxes) per sales dollar in 1941 was 5.3 per cent; in 1942, 3.2; in 1943, 2.2; in 1944, 2.0; and in 1945, 2.2. However, that industry's net sales, considering 1941 as 100 per cent, rose to 236 per cent in 1942, climbed on to 372 in 1943, then eased off to 357 in 1944 and to 255 per cent in 1945.

Steel Industry Down — Meanwhile, the iron and steel industry experienced a continual decline in net income after federal taxes. Considering 1941 as 100 per cent, that industry's net income after federal taxes sloughed off to 84 per cent in 1942, 74 per cent in 1943, 64 per cent in 1944 and 49 per cent in 1945. This was the result of substantial declines in net profit (after taxes) per dollar of sales, for net sales as a whole were up moderately. Net profit (after taxes) per sales dollar was 7.0 cents in 1941 but dropped as follows: To 5.1 in 1942, to 4.1 in 1943, to 3.5 in 1944 and to 2.8 in 1945. Based on 1941 as 100, the iron and steel industry's net sales in 1942 were 115 per cent; in 1943, 126 per cent; in 1944, 129 per cent and in 1945, 122 per cent.

Metals Fare Better — The nonferrous metals industry, however, did not experience quite the sharp drop the iron and steel industry did, largely because the former's per cent of net income (after federal taxes) per sales dollar did not decline as sharply. Considering 1941 as 100 per cent, the nonferrous industry's net income after federal taxes was 81 per cent in 1942, 90 per cent in 1943, 79 per cent in 1944 and 52 per cent in 1945. The nonferrous industry's net sales, considering 1941 as 100 per cent, were 111 per cent in 1942, 126 per cent in 1943, 128 per cent in 1944 and 119 per cent in 1945. Its net income after taxes was 4.6 cents per dollar of sales in 1941, 3.4 cents in 1942, 3.3 cents in 1943, 2.9 cents in 1944 and 2.0 cents in 1945.

The electrical machinery industry reported its net income after taxes (1941 as 100) at 93 per cent in 1942, at 90 per cent in 1943, at 107 per cent in 1944, and at 88 per cent in 1945. Its net sales, considering 1941 as 100 per cent, are reported as 137 per cent for 1942, 191 per cent for 1943, 217 per cent for 1944 and 193 per cent for 1945. The electrical machinery industry's net profit declined from 6.8 cents per sales dollar in 1941, to 4.6 cents in 1942, to 3.5 cents in 1943, to 3.4 cents in 1944 and to 3.1 cents in 1945.

Machinery Shows Gain — The machinery industry, except electrical, had a net income after taxes in 1942 of 108 per cent of the 1941 level; in 1943, 101 per cent; in 1944, 82 per cent; and in 1945, 66 per cent. Net sales of the machinery industry, considering 1941 as 100 per cent, were 139 per cent in 1942, 172 per cent in 1943, 179 per cent in 1944 and 159 per cent in 1945. Meanwhile, the machinery industry's net profit (after taxes) per dollar of sales declined progressively as follows: 9.3 cents in 1941, 7.2 cents in 1942, 5.4 cents in 1943, 4.2 cents in 1944 and 3.9 cents in 1945.

Auto Group Lower — The automobile and equipment group's net income was lower in the war years than in 1941. Based on 1941 as 100 per cent, the net income (after federal taxes) was 81 per cent in 1942, 93 per cent in 1943, 88 per cent in 1944 and 84 per cent in 1945. However, that group's net sales, considering 1941 as 100 per cent, were 99 per cent in 1942, 154 per cent in 1943, 177 per cent in 1944 and 143 per cent in 1945. Its net income after taxes was 7.4 cents per dollar of sales in 1941, 6.1 cents in 1942, 4.5 cents in 1943, 3.7 cents in 1944 and 4.4 cents in 1945.

Mill Supply Groups Plan Program for Gatherings

Program for a series of joint regional meetings for the 1947-1948 season has been announced by American Supply & Machinery Manufacturers' Association, Pittsburgh; National Supply & Machinery Distributors' Association, Philadelphia; and Southern Supply & Machinery Distributors' Association, Richmond, Va.

Included on the agenda will be discussions of "Today's Need for Training in Salesmanship for Salesmen and Sales Managers," "Selection of Salesmen—Use of Aptitude Testing," "Customer Coverage—Market Evaluation," "Packaging and Labeling," and "Distributors' Stock Arrangement and Display."

An open forum will feature an analysis of "Simplification of Pricing," "Inventory Control," "Specialization vs. Generalization," "Equipment Selling vs. Supply Selling," "Incentive for Salesmen," "Evaluation of Lines," "Importance of Planned Mailing Program for Distributors," and "Open vs. Selective vs. Exclusive Merchandising Policy."

The former two supply groups will participate in sessions on Oct. 31 at the Netherland Plaza, Cincinnati; during November at a date yet to be announced in Newark, N. J.; on Jan. 14, 1948, at the Copley Plaza, Boston; and on March 23 at the Palmer House, Chicago. All three organizations will participate in a meeting Jan. 8, at the Edgewater Gulf Hotel, Biloxi, Miss.

Purchasing Meeting Features Forum, Economic Summaries

Discussions of economic affairs and a forum on packaging featured the first annual Purchasing Agents' Conference of the sixth district, National Association of Purchasing Agents, at the Hotel Cleveland in Cleveland recently.

Russell Weisman, associate editor of the *Cleveland Plain Dealer,* predicted business activity would continue on a high level next year.

The forum on packaging emphasized problems in regard to handling nonferrous metals, steel, chemicals, fuels and building materials.

British Adopt Important New Patent Policy

Licensing of government-owned patents in U. S. involved. Proposed reciprocal arrangement rejected on two counts

BRITISH government has adopted a new patent policy which will be of increasing interest to United States industry. It has made a start in the field of jet motors, on which the British government holds many patents here. On the basis of experience to date, the new policy is to be applied generally.

In brief, the British government is permitting its home manufacturers of jet motors to appoint American licensees under United States patents owned by the British government. As an example, Rolls Royce, which has developed its own engine under government-owned patents, now is negotiating a licensing arrangement with the Pratt & Whitney Division of Niles-Bement-Pond Co.

Civilian Managed—The British government has vested ownership of all its patents in the jet propulsion field in Power Jets Ltd. which, while 100 per cent government-owned, is managed by non-government men who have had wide experience in the aviation engine business. Power Jets Ltd. licenses United Kingdom manufacturers to use its patents at a royalty of around 2½ per cent of the selling price of the product, and permits them, under proper scrutiny, to grant licenses to foreign firms.

The new policy is of special significance in view of the failure of our State Department to negotiate the reciprocal arrangement recently called for by President Truman. It was proposed that British firms would be permitted to use United States government-owned British patents on a royalty-free, nonexclusive basis, while American firms would use British government-owned United States patents on the same basis.

Causes for Rejection—The British rejection is based on two grounds. First, the British look upon their patent ownership here as a revenue-producing business; they want to use it to improve their dollar position. Second, the British do not like our policy of licensing government-owned patents on a royalty-free basis; they think such a policy encourages non-use of patents.

Finally, the British point out that the United States government owns very few British patents, whereas the British government owns vast numbers of American patents. In other words, the trading position of the United States in this particular negotiation has been extremely poor.

Incidentally, expectations are that British companies will try to collect from their American licensees a higher royalty than they are paying on the same inventions to the British government. This is due partly to the high respect in which the British hold the American genius for cutting down costs through mass production methods. They are not going to take a chance of having their home markets flooded with their own goods produced at lower costs in the U. S.

KOREAN TUNGSTEN

Large lot of tungsten ore—over 800 tons—is being brought in from Korea and current expectations are the U. S. Commercial Co. will offer it for sale to private buyers.

This RFC subsidiary on Oct. 9 sold 315 net tons of bulk lead scrap and 824 net tons of scrap lead in ingot form at an average price of 13.036 cents per lb for the former and 13.5022 cents for the latter, fob cars, Howland Hook, Staten Island, N. Y.

Successful bidders were: Aetna Smelting & Refining Co., Jersey City, N. J.; American Smelting & Refining Co., New York; Irving Metal Co. Inc., New York; Metro Smelting & Refining Co., Philadelphia; Schuylkill Products Co. Inc., Baton Rouge, La.; and Standard Rolling Mills Inc., Brooklyn, N. Y. This lead was from Japan.

On Oct. 29 the U. S. Commercial Co. will open bids on 23 more lots of Japanese lead aggregating 880 net tons. The metal may be inspected from Oct. 27 through 29, upon application, at Seller's warehouse, Staten Island, N. Y.

Other offerings will be made public shortly; the U. S. Commercial Co. has more lead to sell and, in addition, has some interesting odd lots like lead-base bullion and a Korean brass of unusual analysis.

MIT Plans Basic Turbine Studies In New Facility

Fundamental research on gas turbines scheduled for $500,000, industry-sponsored laboratory

MASSACHUSETTS Institute of Technology has opened its industry-sponsored, gas turbine laboratory in Cambridge, Mass., and will use the facilities for advanced graduate instruction and fundamental research in this field of engineering.

Construction of the two-story project was financed by grants totaling over $500,000 from Alfred P. Sloan Jr., chairman of General Motors Corp.; General Electric Co., Westinghouse Electric Corp., United Aircraft Corp., General Machinery Corp. and Curtiss-Wright Corp. The U. S. Navy also contributed by providing some of the equipment.

In discussing the significance of the new laboratory, Prof. Edward S. Taylor, its director, stressed the growing importance of the gas turbine as a power plant. "The gas turbine," he said, "is definitely beyond the experimental stage as a means for propulsion of aircraft and is under consideration for locomotives, ships and stationary power plants."

Long-Range Research—It was decided to devote the laboratory facilities, continued Prof. Taylor, "to long-range research with the objective of discovering basic principles rather than for development work on specific pieces of apparatus."

Among the many pieces of equipment in the laboratory is a high speed wind tunnel capable of operating up to three times the velocity of sound. This tunnel will be used at first to study the problem of the flow of air into the inlet of propulsion engines for supersonic airplanes.

Another item will make it possible to investigate the nature of flow through compressor and turbine blades. This instrument, known as a cascade device, will operate at first at low velocities, and with this background of knowledge, a device for operating at high speeds will be designed.

Still another instrument, known as an interferometer, makes it possible to measure the density in a moving fluid by passing a beam of light through it.

Larger British Exports May Cut Domestic Supply

Output of steel, coal and pig iron rises, but home needs will be secondary under expanded export program

BIRMINGHAM, ENG.

CONSUMERS of steel in England are hopeful that the recent increases in steel, coal and pig iron production are indicative of the future trend. Vast quantities of these materials will be required in the next 12 months if the government's expanded export program is to succeed, and producers are making every effort to meet the huge demand.

Output of coal, particularly, has been stepped up and is now exceeding the tonnage mined when miners were on a six-day week. Absenteeism has declined and full agreement has been reached between the miners and the National Coal Board on proposals for working longer hours, either on the weekends or during the week according to the districts. A plan to speed the haulage of coal to those points most in need of it has also been worked out.

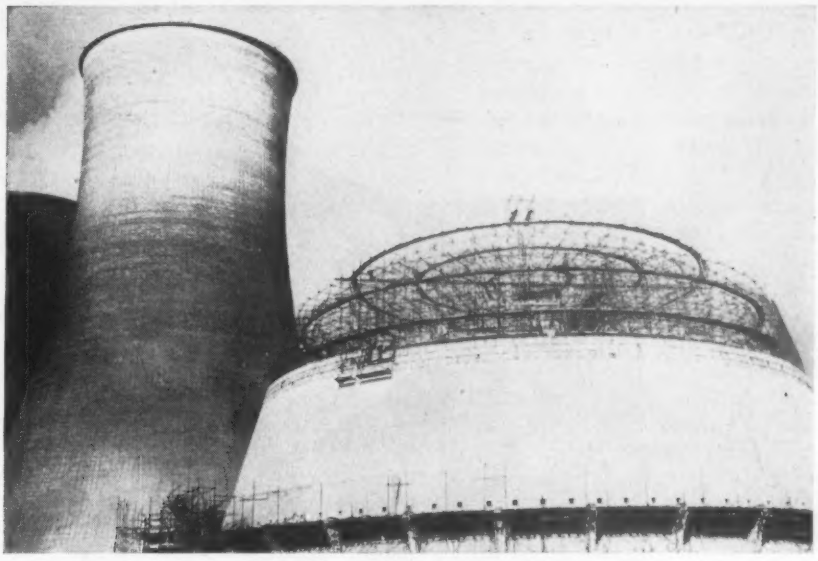
Exports To Come First—In outlining plans for the engineering industry, the Minister of Supply declared that more steel will be available for export production even though this means a restriction in supplies for home production of machinery and civil engineering works. British trade is already hedged about by controls and with licenses now required for the manufacture of automobiles, motorcycles and bicycles, it is clear that an increase in exports can be achieved only by a hard squeeze on the supply to the domestic market, with attendant inconveniences, dislocation and hardship to manfacturers who do not succeed in diverting their output to export.

For such priority goods as heavy electrical and coal mining machinery, allocations of raw materials are to be made to individual firms according to their actual production performance for export and essential domestic production.

In most steel-using industries, shortage of materials and labor is preventing working off tremendous order backlogs for export. The textile and foundry trades, particularly, are hampered by shortage of skilled labor, and it is doubtful whether the new program of labor direction will ease this situation materially. Foundries have not noted an improvement in iron supplies, the larger output recently having been in basic iron for steelworks.

Steel for Ships—Shipbuilders welcome the promise of greater steel supplies to be given them under priority for construction for export. Although some 200,000 tons of new shipping are on order with Scottish yards for overseas buyers and also a considerable tonnage for British owners, the industry has been able to operate at only slightly above 50 per cent of capacity because of materials and labor shortages, and to a negligible extent rising costs. To insure sufficient shipping tonnage for the envisioned export program, the General Council of British Shipping has been appointed to supervise best utilization of the country's ships.

The shortage of semifinished steel for rerolling is so serious firms cannot know from week to week what their supplies of billets and sheets bars will be. Imports of these products are very small, with mills in South Wales, the Northeast Coast and the Midlands desperately trying to supply demand.



ENGLAND BUILDS POWER STATIONS: To bridge the gap between electric power supply and demand, the United Kingdom is building a number of huge power stations which will cost $300 million in the next two years. By 1950, present power supply will be more than doubled. Shown above is power station at Hams Hall, Birmingham, largest in central England. NEA photo

U.S. Executive Says Belgium Undergoing Rapid Recovery

Belgium, unhampered by burdensome government controls, appears to be making more progress on the road to recovery than other wartorn European countries, Harold W. Sweatt, president of Minneapolis-Honeywell Regulator Co., said on his recent return from Europe.

Mr. Sweatt spent three weeks in Europe, principally to attend a two-day session of the company's European managers in London.

Although the importation of heating controls is largest in Sweden, Mr. Sweatt said, the demand for industrial instruments from the company's subsidiary, Brown Instrument Co., has been most noticeable in Belgium where activity in the steel and chemical industries is heaviest.

In England, he reported, the rate of recovery is slow. On the continent the situation is considerably better, with Holland, Switzerland, Sweden and Belgium carrying on a brisk business in the firm's instruments.

Imports Required To Meet Spain's Farm Tool Needs

Spain's requirements for imported farm machinery in 1947-48 are estimated at 8135 metric tons, valued at approximately $4,246,250, the Department of Commerce has been advised. The United States is expected to be the chief source of supply.

A shortage of dollar exchange might reduce purchases to about one-half of requirements. The chief need is reported to be for tractors, tractor plows, harrows and cultivators.

Fitting the bearing to the Job

What may seem a toughie for you, may be simply solved by the Hyatt Engineering Staff.

These men know just how, why and where Hyatt Roller Bearings fit in almost any design—to meet your specific requirements.

Speed—load—position—every factor will be studied and you'll get the right answer.

For fifty-five years Hyatt has served automotive — industrial — agricultural and transportation folks with the finest roller bearings.

Let's work together on your next bearing problem to fit the bearings to the job not the job to bearings. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Willys-Overland expounds product philosophy of whole series of vehicles based on one design. Two new models, including 6-cylinder station sedan and 4-passenger convertible, being planned at Toledo

DETROIT

PRODUCT philosophy is a rather highsounding term which has had no particular identification with the automotive industry until recently when Willys-Overland took it up. Perhaps General Motors' "more and better goods for more and more people" might be considered a sort of blanket-type product philosophy, but Willys has narrowed its own concept down to the point where it has carved out an independent niche, free, for the present at least, from counterparts and competitors. It has no battle with the "big three," which puts the company in an enviable position.

At the institutional day celebration in Toledo last week, Delmar G. "Barney" Roos, Willys engineering vice president, expounded at length on product philosophy. He naturally deplored the "flowing dough" school of passenger car design and said that overstyling always necessitates seasonal model changes which, being an expensive practice for both the motorist and the manufacturer, is something Willys is trying to shun.

The jeep, of course, was the idea which touched off the new philosophy, charting as it did the policy of building a complete line of unique, utilitarian and economical vehicles, now numbering eight cars and trucks. All are designed around the jeep "face," not the most beautiful in the world, by Roos' own admission, but still sturdy, simple and practical. Each of the units is aimed to fill a particular neglected field and because of the standardization and interchangeability between the different types, an otherwise heavy tooling cost has been avoided. Beyond this, interchangeability permits flexibility in inventory and plant operations. Should any particular model outlive its popular acceptance, it can be dropped without closing the plant, and a new version of the basic pattern evolved.

The two newest jeep children, slated for production early next year, are a 4-passenger convertible (canvas top and side curtains) on station wagon chassis with reinforced frame and 4-cylinder engine, and an all-steel station sedan with 6-cylinder engine — a deluxe version of the present jeep station wagon. A pilot model of the former was shown in Toledo last week, painted a fire-engine red with cream striping and trim, low-slung front and rear seats of gray vinylite. To many old-time automotive observers it recalled memories of the famous Stutz Bearcat model of years ago. Production is being deferred pending a few minor engineering changes. Price, it is hoped, will be around $1000 or less, and the car is aimed specifically at the youthful market, being definitely "Kollege Kut."

Second of the new models is similar in construction to the present jeep station wagon, but interior and upholstery are of the conventional passenger car types. Dashboard has been brightened with chrome trim. Exterior finish is a solid color, broken only by a decorative basket-weave trim running around the body. Engine is a new 6-cylinder type, and the model will be priced at about $200 over the station wagon which currently carries a delivered price of better than $1700.

Willys still is contemplating taking at least one step away from its pattern line—that in the direction of a 2600 pound 6-cylinder passenger car on 104-in. wheelbase. A plaster model was on display at Toledo and was unusual in that one side carried the two-door lines and the other side the four-door lines. Numerous changes had been effected since the same type of mockup was exhibited a year ago. Production plans have been deferred until the end of next year at the earliest.

Export market has been a lush field for the jeep line, although some squeezing of this market seems in store because of the limitations being placed by various foreign governments on the import of American automotive products. A recent deal negotiated by Willys with the government of Argentina involved the sale of 8200 jeep units for approximately $11 million. Most of the vehicles are being assigned to police, post-office and agricultural work, particularly in the interior where poor roads make for rough going.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1947	1946
January	373,872	126,082
February	399,717	84,109
March	441,798	140,738
April	449,388	248,108
May	390,629	247,620
June	418,919	216,637
July	396,932	331,100
August	360,221	359,111
September	452,068*	342,969
October		410,510
November		380,664
December		380,908
12 mos.		3,268,456

* Preliminary.

Estimates for week ended:

Sept. 27	106,894	83,995
Oct. 4	101,608	91,925
Oct. 11	97,372	86,330
Oct. 18	88,000	89,540

Steel Shortage Closes Plants

Depletion of steel inventories at Chrysler and Briggs Mfg. Co. plants last week caused the suspension of all Chrysler Division assembly operations, with the exception of Chrysler 8-cylinder models, and the resulting layoff of 20,000 at Chrysler, Dodge, Plymouth and DeSoto, plus possibly another 20,000 in Briggs and related parts plants. Two large Briggs plants closed week before last, and the failure of anticipated steel tonnage to arrive forced them to remain closed last week. All operations are scheduled to resume this week, although the interruption will mean the loss of possibly 15,000 passenger cars. Dodge truck production was not affected, as this division is running out its schedule preparatory to closing for a model change.

The layoffs drew immediate action from leaders of the UAW-CIO locals involved, who telegraphed President Truman for an appointment to urge a conference of leaders from the unions and corporations in the steel and automobile industries. At this point the comment might be injected

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

"USED" CAR AUCTION: A parade of cars lines up each week for the "used" car auction at Montpelier, O., but few of them are old jalopies. Most are shiny, new postwar models, which generally command a price well above the new car list. The 1947 four-door Studebaker shown above was sold for $2760. Similar auctions are being held in many American cities. NEA photo

that all the conferences in the world will not produce so much as one more ton of steel. At any rate, the Chrysler union leaders bitterly informed the President: "Tuesdays have been meatless days for auto workers for many months, as well as most Mondays, Wednesdays, Thursdays, Fridays and Saturdays." In 12 months, the union claims, Chrysler employees have experienced nine periods of unemployment, ranging from one to seven weeks.

UAW Politics

Detroit is still chuckling over the weird prediction of a national radio commentator to the effect Walter P. Reuther of the UAW-CIO might be sought out as a running mate on the Republican presidential ticket with Sen. Robert A. Taft. The statement burned up no one more than it did Reuther himself who called the broadcaster "a chronic liar and a fool." His diagnosis that the story was deliberately planted with the broadcaster by a newly hired ($300 a week) press agent of his rival faction within the UAW-CIO to influence convention delegate elections now in process against Reuther is probably pretty close to the truth.

Asks Pensions of GM

It is readily possible to tie just about everything emanating from the UAW-CIO these days to efforts either to sustain or unseat Reuther. The tinge is unmistakable, for example, in Reuther's statement of minimum standards which must be met in working out any pension program for General Motors employees. There have been no discussions whatever of such pensions, except the union's request to start them. Reuther's "standards" call for pensions which are in addition to and not in lieu of wage increases, minimum benefits equal to 50 per cent of wages, preferably more, employer contribution of 60 per cent of pension cost, joint administration of the program, retirement before age 65 for certain groups, and other lesser points.

Foundry Increase Planned

Plans to increase the capacity of the Chevrolet Gray Iron Foundry in Saginaw from 1900 tons a day now being melted to an eventual 3600 tons daily are moving ahead, with one fly in the ointment being a source for the large amount of foundry coke which will be required. At the lower rate of production, the plant is consuming nearly 2000 tons of coke a week. Foundry coke throughout the industry has long been in tight supply and is not loosening up appreciably. Logically, Chevrolet and General Motors, in the face of the proposed foundry expansion at Saginaw and elsewhere, have been scouting around to see what can be done about securing more coke.

One possibility, of course, is to build a coke plant, but this is a costly and long-range proposition. A better hunch seemed to be to acquire the output of a plant now operating. Attention naturally turned to the numerous artificial gas plants operating by-product coke ovens primarily as gas producers. With the spread of pipeline networks from the southwest, bringing natural gas into more and more middlewestern industrial areas, the time of the artificial gas plant is fast running out. If a plant can be located not too far from coal fields nor too far from the foundries requiring the coke output, its acquisition as a coke source makes sense.

While not yet officially confirmed by GM, reports from the trade indicate the corporation either has purchased or acquired an interest in the North Shore Gas Co., Waukegan, Ill., operating 31 Kopper-Becker type ovens with capacity of 310 tons of coke daily. Coke from this plant is now moving to Saginaw, shipments being by rail to the car-ferry across Lake Michigan, docking at Ludington and proceeding by rail to destination.

K-F Plans Engine Plant

At a testimonial dinner honoring E. J. Hunt, Kaiser-Frazer production manager, it was revealed the company is contemplating early construction of a new $10 million engine plant, location as yet undisclosed. Further the company is planning two-shift operations at Willow Run to push production up to 1500 a day from the present 800, and an early start on assemblies at a Long Beach, Calif., plant, which eventually will add another 500 to daily output. Profit of an estimated $20 million is looked for this year, wiping out the loss of about the same amount experienced last year.

Reo Offers Heavy Duty Trucks

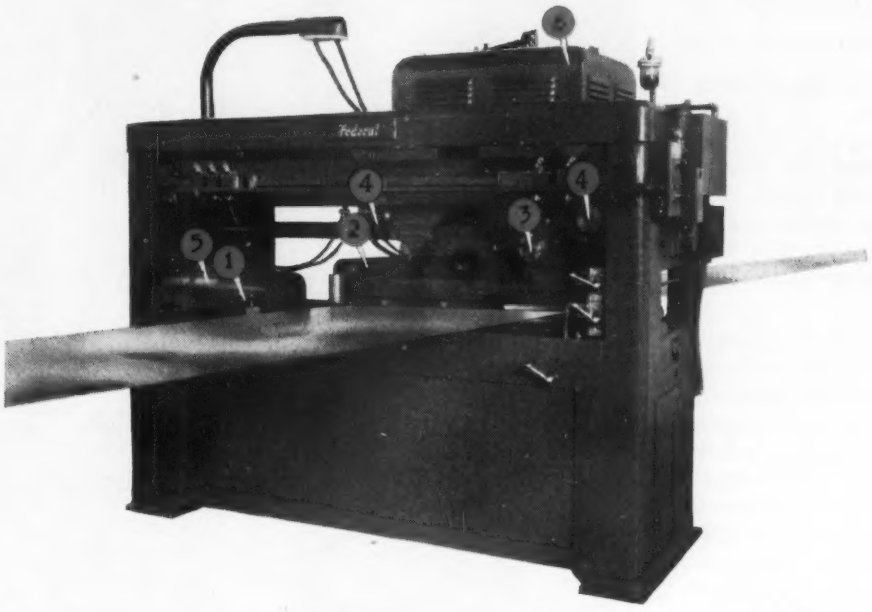
Reo Motors Inc. has added two new heavy trucks to its 1948 line. Designated as models 30 and 31, they are powered with 2000-hp engines and are designed to haul up to 38-ton loads. Each has a 75-in. full-vision cab with V-windshield and safety glass throughout.

Crosley Nets $476,065

Crosley Motors Inc. of Cincinnati had a net profit of $476,065 in the fiscal year ended July 31, first full year of operations since its organization. Production for September was 2410 cars and company now is aiming at 3000 units monthly.

Federal

puts the heat on strip production



FEDERAL'S new 125 KVA double roll traveling head series seam welder cuts costly delays, eliminates idle man and machine time *by making any strip mill a continuous mill* Expressly designed for strip mill use, it rapidly joins strip ends in one easy, semi-automatic operation. Check these features yourself—

FOUR STANDARD SIZES for 38, 48, 56 and 66-inch line, either right or left hand.

1. **VARIABLE SPEED DRIVE.** Change gear gives speed ranges of 10 to 27 FPM or 20 to 54 FPM.

2. **CENTER CLAMPING BAR** between wheels clamps strips for welding.

3. **REMOVABLE SPINDLE** for rapid wheel changes.

4. **ANTI-FRICTION BEARINGS.** Carriage moves on V-type wheels mounted in anti-friction bearings.

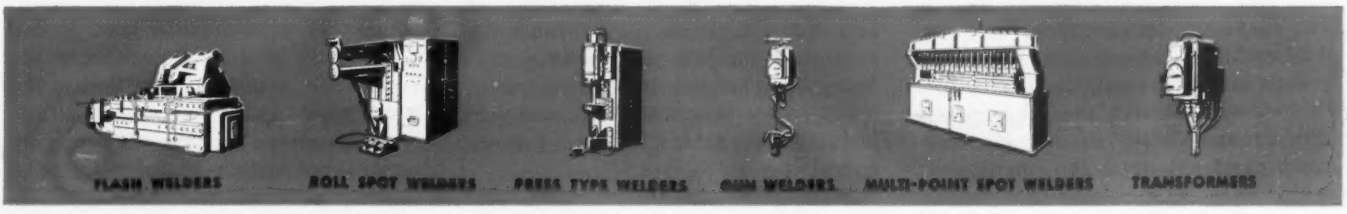
5. **ENCLOSED CARRIAGE DRIVE.** Carriage drive enclosed in welder frame.

6. **COVERED TRANSFORMER** with 16-step heat regulation.

Let Federal show you the time-saving, profit producing possibilities of resistance welding as applied to your production. Write today for further information. Or better still, arrange a free consultation with one of Federal's qualified engineers. Write

THE FEDERAL MACHINE AND WELDER COMPANY

Dept. 4107, Plant 2, Warren, Ohio • • *Offices in Principal Cities*



American Brake Shoe Co. Opens Modern Foundry

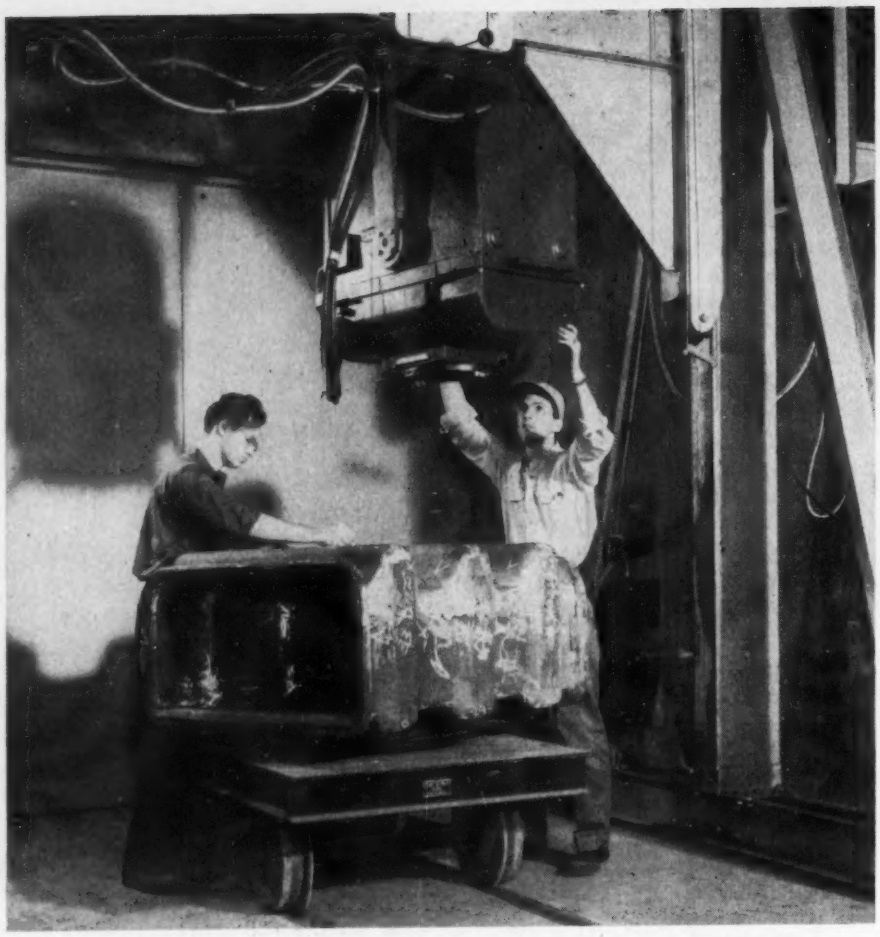
High alloy castings production will be doubled by new $3 million plant highly mechanized and designed for cleanliness

REPRESENTING a long step away from the old conception of a foundry, the new $3 million high alloy foundry of the Electro-Alloys Division of the American Brake Shoe Co., New York, has been put into operation at Elyria, O.

The new installation is distinguished by concrete floors, pleasing type of architecture, forced ventilation and mechanical cleaning of air, generous supply of evenly distributed natural and artificial light, and a high degree of mechanization. In doing the architectural and engineering designing for the new plant, the Brake Shoe company's construction and maintenance department worked on the premise that a foundry need not be dark and dirty, that the work need not be "back-breaking," and that every effort should be made to extend mechanization.

The new plant has more than 150,000 sq. ft. of floor space. This includes a two-story office building, a two-story welfare building with lunch and wash rooms, a fully-equipped dispensary, pattern shop and storage building, a building housing the heating plant, a machine shop building, and the foundry itself, which measures 460 by 280 ft. All construction is of steel and brick, with generous use of glass block throughout. Roof of the foundry is monitor type covered with precast concrete slabs. Among features of the plant are the tunnels, pipes and conveyor systems for sand handling and dust collecting equipment beneath the foundry floor.

Highly Mechanized—Mechanization is as nearly complete as practicable in an alloy foundry producing miscellaneous sizes and shapes of castings, the company pointed out. Sand-conditioning equipment is located in the center of the foundry. Conditioned sand moves overhead on a continuous belt conveyor delivering to hoppers at 18 molding stations along the route to each end of the building. After the mechanical shakeout, the sand moves underground back to an elevator which carries it up to the conditioner again.



In keeping with its aim to simplify and ease work in its new $3 million foundry at Elyria, O., the Electro-Alloys Division of American Brake Shoe Co. laid out two radiographic rooms so that x-raying can be done with minimum effort even in the most difficult examining positions on complicated castings. Above, two radiographers are marking up a muffle section for x-ray examination

Equipment located in the molding department includes jolt rockover molding machines, jolt squeeze strip molding machines, jolt squeeze molding machines for snap molds, floor jolt molding machines, and a sand-slinger for larger castings. Gravity roller-type conveyors are conveniently located to carry molds away from molding machines.

Dust-laden air is removed by hoods over and under each shakeout, and delivered to five cleaners where it is washed and returned to the shop. Nine power ventilators in the monitor roof remove smoke and gases from the melting furnaces and the pouring floor. A complete change of air is effected every six minutes. Floors are cleaned by powered, mechanical sweepers.

Automatic Controls Utilized—Three electric induction melting furnaces and three top charge, hydraulically controlled electric arc melting furnaces are located in the center of the foundry. An automatic electrical installation controls the furnace operations.

Brake Shoe company's alloy production formerly was divided between the old Electro-Alloys plant in Elyria and the alloy department of the American Manganese Steel Division's plant in Chicago. All of the Brake Shoe company's alloy production will now be concentrated at Elyria. When in full production this foundry will double the company's previous heat- and corrosion-resistant alloy output.

Timken-Detroit Modernizes To Combat Mounting Costs

As part of its plan to combat rising costs, Timken-Detroit Axle Co., Detroit, reveals that it has spent over $9 million on new product development, tooling and facility expansion since the end of the war.

This manufacturer of axles, automotive parts, oil heaters and related equipment also reports that it has lowered its profit percentage in the cost battle, with the result that in the fiscal year ended last June 30 its earnings were at a rate less than that earned per dollar of sales in years directly prior to the war.

BRIEFS . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Atomic Energy Commission reports that Clinton Laboratories at Oak Ridge, Tenn., have been renamed Clinton National Laboratory and that operation of the facility will be taken over by the University of Chicago from Monsanto Chemical Co.

—o—

Youngstown Sheet & Tube Co., Youngstown, recently received safety awards for its South Chicago plant, Indiana Harbor Works at East Chicago, Ind., Brier Hill plant in Youngstown and Hubbard Blast Furnace near Youngstown at the National Safety Congress in Chicago.

—o—

Bendix Home Appliance Inc., South Bend, Ind., has appointed the following foreign distributors for its household equipment: Masters Ltd., Hamilton, Bermuda; Agencias Consolidadas, Managua, Nicaragua; Casa Saprissa S. A., San Salvador, El Salvador; J. Ramirez MacGregor S. A., Maracaibo, Venezuela. Replacing previous distributors are J. E. Breault Ltd., Honolulu, T. H., and Martin de Botelho Corp., New York, which has all of Brazil for its territory.

—o—

Pierce-All Mfg. Co., Brazil, Ind., newly formed, has leased part of the plant of Indiana Foundry & Machinery Supply Co. for the manufacture of farm machinery, including a newly patented elevator apparatus.

—o—

War Assets Administration has sold a sodium bichromate production facility in Kearney, N. J., to the wartime operator, Martin Dennis Co., for $204,000. Buyer will continue to produce sodium bichromate.

—o—

Lindberg Engineering Co., Chicago, manufacturer of furnaces, transformers and cylinders, has opened a Cleveland sales office at 1114 NBC Bldg. with Stuart K. Oliver in charge.

—o—

War Assets Administration has disposed of more than 75 per cent of the government refineries erected during the war at a cost of $260 million. Of the 33 refineries which became surplus, only seven now remain.

—o—

Liquid Carbonic Corp., Chicago, manufacturer of bottling machinery, fountain cabinets and related equipment, has dissolved Liquid Carbonic Pacific Corp., a sales and service subsidiary, and has formed in its place a Pacific Division with H. C. Mathey as general manager with headquarters in Los Angeles.

—o—

International Nickel Co., New York, has appointed Metal Goods Corp., Denver, as distributor of primary nickel for alloying purposes and mill forms of Monel, nickel and Inconel in Colorado, Wyoming and New Mexico.

—o—

Republic Steel Corp., Cleveland, reports that the following divisions and plants have received first awards from the National Safety Council: South Chicago Works, Steel & Tubes Division at Cleveland, Niles Steel Products Division at Niles, O., Union Drawn Steel Division at Beaver Falls, Pa., Dilworth Porter Division at Pittsburgh, Truscon Steel Co. at Canton, O., Grand Crossing plant at Chicago, Ideal Foundry at Newton Falls, O., and Truscon Steel Co. at Youngstown.

—o—

Deere & Co., Moline, Ill., manufacturer of farm implements, has purchased from WAA for $4,150,000 the industrial portion of the Des Moines, Iowa, Ordnance Plant.

—o—

Continental Industrial Engineers Inc., Chicago, has appointed Cardox Corp., Chicago, as its exclusive sales representative for the Continental inert gas generator. Continental also designs, makes and sells special machines, industrial furnaces and kilns.

—o—

Paul Cypres Iron Works, New York, sheet and plate fabricating company, has changed its name to Cypres Formed Steel Products Inc. Ownership and personnel remain unchanged.

—o—

Acme Steel Co., Chicago, has purchased Hoffert Machine Co., Printers Supply Co. and Ajax Tool & Die Co., all of Racine, Wis. The three companies will be operated as Hoffert Division of Acme which will manufacture stitching machines for the bookbinding and container industries.

—o—

Otis Elevator Co., New York, has closed its Buffalo plant and consolidated the facilities with other factories of the firm. About 90 per cent of the production has been transferred to the works at Harrison, N. J., and 10 per cent to the plant at Yonkers, N. Y.

—o—

Texasteel Mfg. Co., Ft. Worth, Tex., maker of oil field equipment, has appointed Texoma Supply Co., Tulsa, Okla., as its exclusive sales representative in the United States.

—o—

SKF Industries Inc., Philadelphia, manufacturer of ball and roller bearings, has opened a plant in Hornell, N. Y. This plant, part of a $4 million expansion and modernization program undertaken by SKF, will make bearing pillow blocks.

—o—

Acheson Colloids Corp., Port Huron, Mich., producer of colloidal graphite products, has purchased its British counterpart, E. G. Acheson Ltd., London, Eng. Despite the similarity in names, there previously was no connection between the two firms.

—o—

Magnaflux Corp., Chicago, manufacturer of magnet inspection equipment, is sponsoring a conference on production inspection through use of its products, in the auditorium of the Engineering Society of Detroit, Detroit, Nov. 10-11.

—o—

Harvill Corp., Los Angeles, manufacturer of dies and die castings, has purchased a die castings plant at 4358 Roosevelt Rd., Chicago, for $750,000. Operations will be conducted by a wholly owned subsidiary, Harvill Mid-West Corp., and are expected to increase the corporation's over-all business by 50 per cent.

HOUSEHOLD AID

Cooking utensils which resist food sticking to them and are capable of being washed by immersing in hot, soapy water will be produced shortly, according to the American Cladmetals Co., Pittsburgh. Through a process developed by Joseph Kinney Jr., copper is sandwiched between layers of stainless steel to produce a clad metal suitable for cooking and many industrial applications where buckling and warping of metal due to spotty heating cause trouble. The company, which plans to produce six to eight million pounds of clad metal annually in a plant in Carnegie, Pa., also plans the cladding of such dissimilar metals as aluminum to steel and silver to steel.

The Business Trend

Slipping Industrial Rate Paced by Auto Output Cut

ALTHOUGH industrial activity has subsided somewhat from the postwar peak which was reached in the week ended Sept. 27 when STEEL's industrial production index registered 166 per cent of the 1936-1939 average, the preliminary rate of 164 per cent for the week ended Oct. 11 has been matched or exceeded during only four weeks since the war's end.

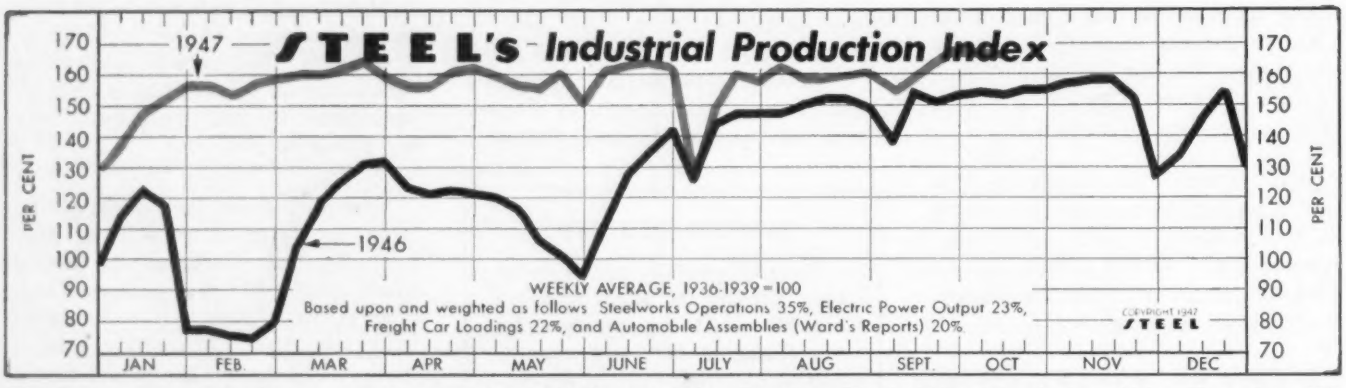
STEEL—The national steel ingot rate of 95.5 per cent of capacity in the week ended Oct. 11 was the highest recorded since mill operations were curtailed in early July.

AUTOS—Insufficiency of steel, despite receipts in excess of those by any other industry, is still causing automobile builders to cease production occasionally to build up stocks. Latest week's output of automobiles and trucks is estimated by *Ward's Automotive Reports* at 97,372 units, down 4236 from the previous week's revised figure, the decline being attributed to temporary suspension by a major builder. Further shutdowns by some interests, which may bring total weekly output to less than 90,000 units for the first time since early September, appear in prospect and may jeopardize the industry's 1947 goal of 5 million units.

RAILROADS—Freight carloadings, reflecting the tremendous amounts of manufactured goods and farm produce currently going into domestic and foreign consumption, are close to all-time high levels. For the week ended Oct. 4, the largest number of cars in 17 years was loaded—a total of 942,533. This figure, only 4.3 per cent below the peak which occurred in 1930, actually represents a greater volume of traffic in ton-miles because cars are currently loaded more heavily, handled faster, and moved greater distances, the Association of American Railroads reports. In the first eight months of this year Class I railroads moved about 12 per cent more revenue ton-miles of freight than they did in the corresponding period of last year. Net railway operating income during these same months was $510 million in 1947 against $299.6 million in 1946.

COAL—Output of bituminous coal, which in the week ended Oct. 4 was estimated by the Bureau of Mines at 12,190,000 net tons, is being held down by a shortage of hopper cars. Currently a number of West Virginia mines are closed because of lack of transport. Coal thus lost from consumption projected over 1947 is estimated at 18 million tons.

PRICES—Small advances in most commodity groups edged the Bureau of Labor Statistics average wholesale price index up 0.6 per cent to 157.1 per cent of the 1926 average in the week ended Oct. 4, making up for some of the price decline which had occurred in the previous week, that drop having been the first in 13 weeks.



The Index (see chart above): Latest Week (preliminary) 164 Previous Week 165 Month Ago 159 Year Ago 153

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	95.5	94.5	82.0	90.0
Electric Power Distributed (million kilowatt hours)	4939‡	4,935	5,053	4,495
Bituminous Coal Production (daily av.—1000 tons)	2,032	2,050	1,775	2,033
Petroleum Production (daily av.—1000 bbl.)	5,251‡	5,208	5,217	4,737
Construction Volume (ENR—Unit $1,000,000)	$93.0	$166.8	$146.2	$81.9
Automobile and Truck Output (Ward's—number units)	97,372	101,608	106,095	86,330

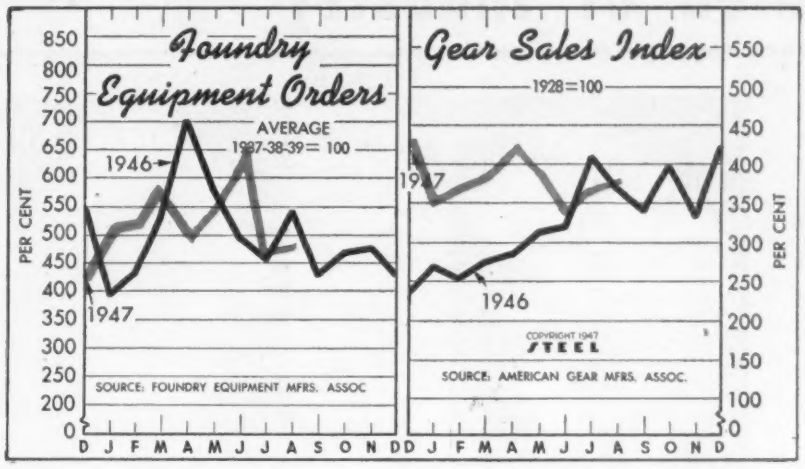
*Dates on request. ‡Preliminary. †1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons.

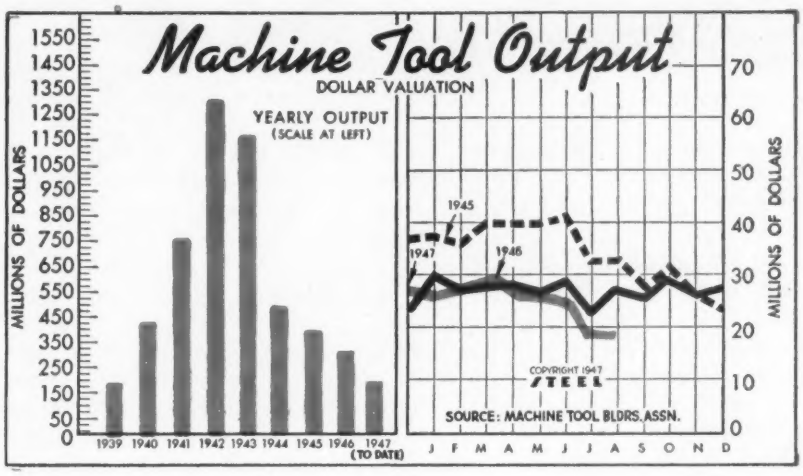
TRADE				
Freight Carloadings (unit—1000 cars)	935†	943	922	899
Business Failures (Dun & Bradstreet, number)	80†	81	75	28
Money in Circulation (in millions of dollars)‡	$28,632	$28,559	$28,742	$28,608
Department Store Sales (change from like wk. a yr. ago)‡	+19%	+23%	+1%	+15%

†Preliminary. ‡Federal Reserve Board.

Foundry Equipment Orders and Gear Sales

	Foundry Equipment Orders —Index (1937-38-39=100)—			Gear Sales —Index (1928=100)—		
	1947	1946	1945	1947	1946	1945
Jan.	513.4	392.8	422.4	350	269	323
Feb.	521.9	432.8	465.3	376	253	331
Mar.	573.8	536.6	604.7	380	275	339
Apr.	512.1	701.2	325.0	424	284	296
May	548.6	577.3	404.7	387	313	309
June	649.9	491.7	375.4	343	321	271
July	458.7	453.4	411.7	361	407	264
Aug.	468.9	538.7	532.2	381	368	205
Sept.	....	424.4	577.2	...	342	213
Oct.	....	469.2	457.8	...	397	251
Nov.	....	477.4	416.6	...	336	255
Dec.	....	430.9	547.6	...	425	239
Ave.	....	493.9	461.7	...	332	275




Machine Tool Output
DOLLAR VALUATION
YEARLY OUTPUT (SCALE AT LEFT)
MILLIONS OF DOLLARS
1939 1940 1941 1942 1943 1944 1945 1946 1947 (TO DATE)
1945
1947
1946
COPYRIGHT 1947 STEEL
SOURCE: MACHINE TOOL BLDRS. ASSN.
J F M A M J J A S O N D

Machine Tool Shipments

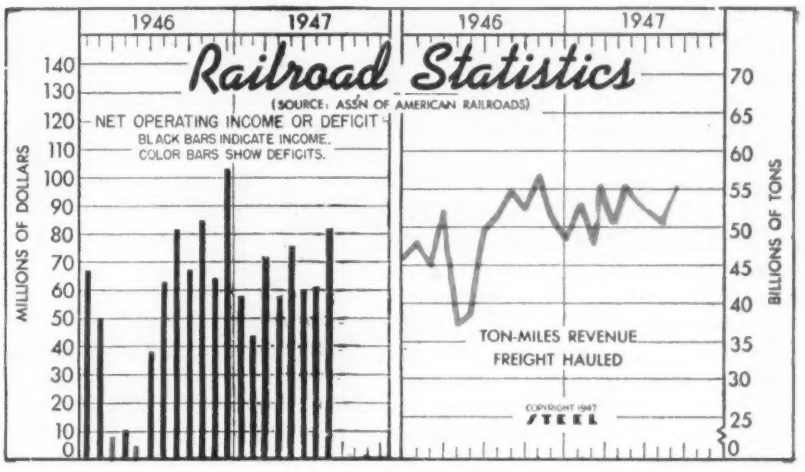
(000 omitted)

	1947	1946	1945	1944
Jan.	$26,542	$30,263	$37,353	$56,363
Feb.	26,765	26,949	36,018	50,138
Mar.	29,012	27,326	40,045	51,907
Apr.	26,857	28,108	40,170	41,370
May	25,791	26,580	39,825	41,819
June	24,383	28,580	41,040	41,471
July	18,924	22,360	32,504	32,753
Aug.	18,520	26,911	32,500	35,177
Sept.	.....	25,468	27,300	35,889
Oct.	.....	29,140	31,200	37,516
Nov.	.....	26,176	26,084	36,277
Dec.	.....	27,587	23,276	36,784
Total	.....	$325,448	$407,315	$497,464

Statistics of Class I Railroads

	Net Operating Income —millions—			Ton-Miles Revenue Freight —billions—		
	1947	1946	1945	1947	1946	1945
Jan.	$57.7	$66.7	$76.0	53.3	48.2	56.8
Feb.	43.1	50.5	74.7	48.5	45.1	55.4
Mar.	72.8	*5.7	102.0	56.1	52.4	64.4
Apr.	58.4	10.7	95.1	50.7	37.4	61.4
May	75.7	*4.6	103.6	56.1	39.5	64.2
June	60.2	37.8	99.9	52.9	49.8	62.6
July	61.0	63.0	98.8	52.0	51.9	60.7
Aug.	80.8	81.9	87.5	55.8	55.8	56.8
Sept.	...	...	67.4	43.1	...	52.7	52.6
Oct.	...	...	85.1	52.4	...	57.0	49.8
Nov.	...	...	64.1	60.7	...	51.5	49.8
Dec.	...	...	103.0	42.0	...	49.6	46.3
Ave.	...	...	$51.7	$78.0	...	49.2	56.7

*Deficit.



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,299	$13,580	$12,026	$11,862
Federal Gross Debt (billions)	$259.8	$259.4	$259.3	$263.7
Bond Volume, NYSE (millions)	$21.9	$23.1	$18.4	$27.6
Stocks Sales, NYSE (thousands)	5,256	5,404	3,718	7,911
Loans and Investments (billions)†	$64.8	$64.6	$63.8	$58.1
United States Gov't. Obligations Held (millions)†	$38,400	$38,680	$38,354	$39,088

†Member banks, Federal Reserve System.

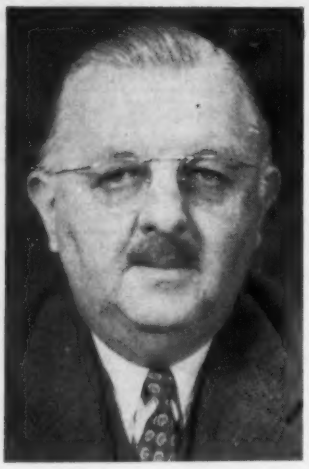
PRICES

STEEL's composite finished steel price average	$75.41	$75.41	$75.41	$64.45
All Commodities†	157.1	156.2	154.9	125.1
Industrial Raw Materials†	172.9	171.1	168.5	144.5
Manufactured Products†	151.4	150.9	150.1	118.1

†Bureau of Labor Statistics Index, 1926=100.

Men of Industry

J. P. JOHNSON



JAMES E. MOSSELL

M. T. HERREID

J. P. Johnson has been elected president of the Romec Pump Co., Elyria, O. Formerly vice president and director of the Aro Equipment Corp., Bryan, O., he has had a varied experience in industrial manufacturing. In 1927 he organized the J. P. Johnson Engineering Corp. where he began developing aircraft pumps. In 1933 he perfected the first fuel pump approved by the U. S. Army Air Corps. He later organized the Pump Engineering Service Corp. to build this pump, and developed vacuum pumps, high pressure oil pumps, primers and valves.

—o—

Caterpillar Tractor Co., Peoria, Ill., announces that **Lloyd J. Ely,** factory manager, will head up the new diesel engine factory, which is currently under construction and is slated for occupancy and partial operation before the end of the year. **John Elwood** will have charge of all diesel track-type tractor production. **Arthur W. Johnson,** assistant factory manager, has been named factory manager in charge of the manufacture of various "earthmoving" products, such as diesel wheel-type tractors, motor graders and cable controls, and the final assembly of bulldozers, scrapers and rippers.

—o—

R. W. Hannan, executive vice president, Pittsburgh Tube Co., Pittsburgh, has been elected president to succeed **J. P. Gangwisch,** who has resigned because of ill health. Mr. Gangwisch has been president of the company since its incorporation in 1924, and Mr. Hannan has also been identified with the company in an official capacity since that time.

—o—

Harry W. Holt has joined Hupp Corp., Detroit, as general sales manager. He was one of the organizers of Bohn Aluminum & Brass Corp., Detroit, remaining with that company in an executive capacity until 1938. Subsequently he became vice president of Wilson Foundry & Machine Co. at Pontiac, Mich., resigning recently from that position.

—o—

James E. Mossell has been appointed sales manager, Machine Tool Division, Buffalo Forge Co., Buffalo. He succeeds the late **Earle G. Leonard.** Mr. Mossell has been associated with Buffalo Forge Co. for 35 years, more than 25 of which have been in machine tool sales. He has represented the company in Pennsylvania, Michigan, Canada and New England, and during this time was also active in home office sales.

—o—

R. E. Crockett has been appointed consulting engineer on mining and beneficiation for Lone Star Steel Co., Daingerfield, Tex. Before entering private practice recently as a general consultant, specializing in the mining and beneficiation of the various raw materials of the steel industry, Mr. Crockett had been in charge of similar work for H. A. Brassert & Co., New York.

—o—

Wickwire Spencer Steel Division, New York, Colorado Fuel & Iron Corp., announces that **Paul E. Ten-Hoopen** has been appointed sales manager of the Realock Fence department. He will continue headquarters in the Curtiss Bldg., Buffalo. **William J. Murray** will continue as assistant sales manager at New York for the department. **James A. Old** has been appointed sales manager, hardware products department, and **W. F. Sewert,** assistant sales manager, will continue in charge until Mr. Old assumes his duties in November.

—o—

M. T. Herreid has been elected president of the newly formed Missouri-Illinois Furnaces Inc., Granite City, Ill. The new company has been formed by Koppers Co. Inc., Pittsburgh, and the Hanna Coal & Ore Corp., Cleveland. Mr. Herreid also is a vice president in the Gas & Coke Division of Koppers Co. Inc.

—o—

Winthrop B. Edwards has been appointed manager, Yonkers, N. Y., plant of Otis Elevator Co., New York, succeeding **John H. Hornung.** The change will be effective Dec. 1, on retirement of Mr. Hornung after 47 years with the company, the past nine as manager at Yonkers. Mr. Edwards has been with the company 43 years.

—o—

C. S. Lawson, vice president, Sloss-Sheffield Steel & Iron Co., Birmingham, has been elected a director of the company. He fills a vacancy created by the resignation of **Henry Parsons,** New York.

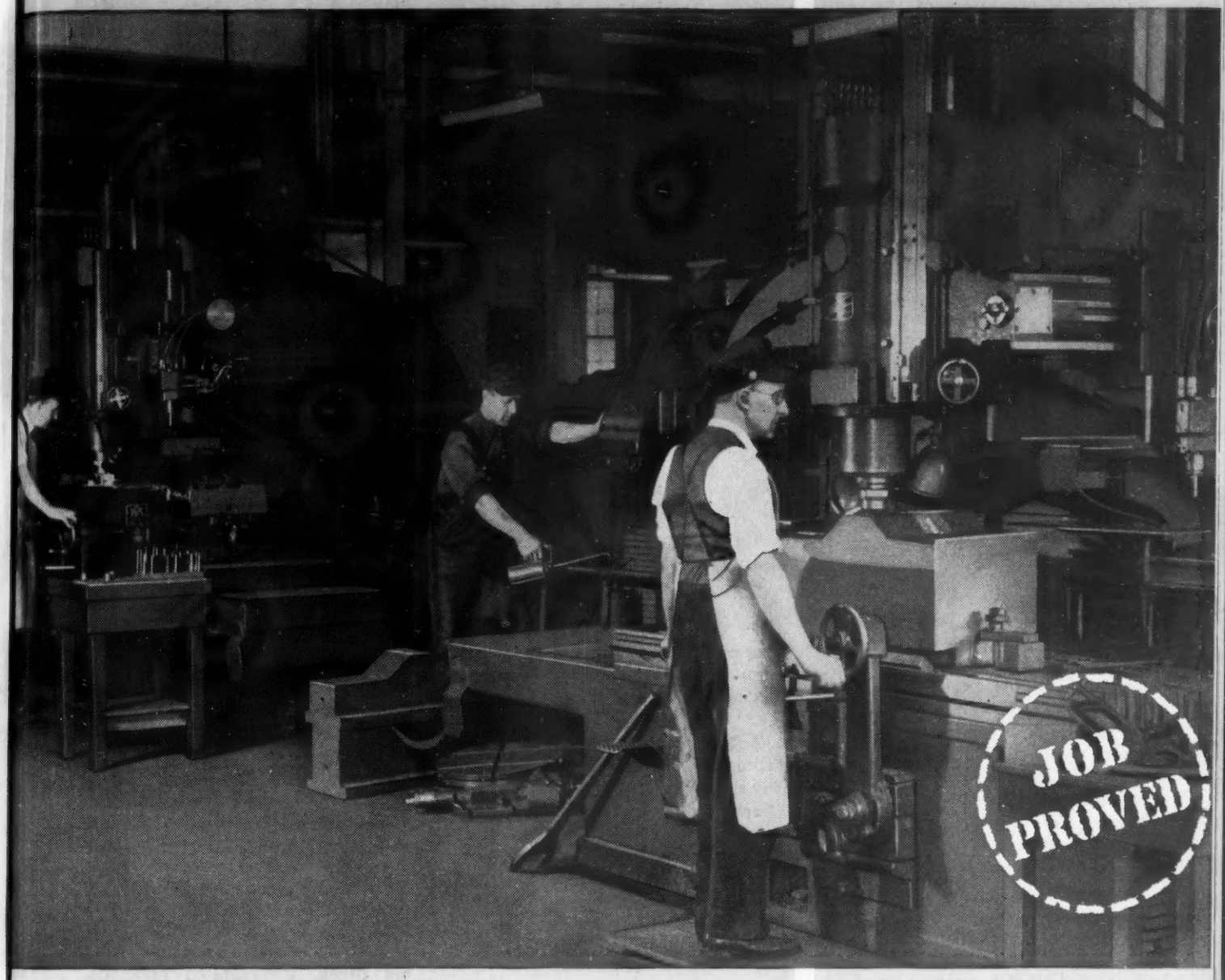
—o—

John H. Williamson has been named manager of industrial relations, Tennessee Coal, Iron & Railroad Co., U. S. Steel subsidiary. He succeeds **Walter J. Kelly,** who has been temporarily transferred to Pittsburgh to serve full time as a member of the board of conciliation and arbitration set up in the contract with the steelworkers.

—o—

National Bronze & Aluminum Foundry Co., Cleveland, announces the following promotions: **J. L. Pet-**

Cutting Out the "Chatter" Improves Quality



SUNOCO WAY LUBRICANT . . .

Increases Accuracy, Eliminates Need for Extra Grinding

A manufacturer of steel products was having trouble with the lubrication of five milling machines. The tableways and cross-slide ways were becoming coated with heavy, dark brown deposits which caused severe chattering. An extra grinding operation had to be specified, and many pieces were rejected because of the quality of the machining.

An outstanding performer, Sunoco Way Lubricant, was recommended by the Sun Engineer who was called in for consultation. With this lubricant in use, table chatter was completely eliminated. Better tolerances were obtained. The additional grinding step was no longer necessary.

Quality of the dies that are being milled has been much improved, and the management now states it would not use any other lubricant on these machines.

Increased production and improved quality are typical results in plants where Sun "Job Proved" lubricants are used. In machine shops, in power plants, in quarries, mines, mills and factories, Sun "Job Proved" lubricants help to "produce more for less." For full information on the Sun lubricants for your machines, call the nearest Sun office, or write Department S-10.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***
In Canada: Sun Oil Company, Ltd. — Toronto and Montreal

SUN
SUNOCO
INDUSTRIAL
PRODUCTS

resky appointed assistant to the president; **William F. Muth,** one of the original organizers of the company in 1911, named sales administrator. Other appointments included **J. B. Rearick,** comptroller, and **A. J. Mosley,** chief engineer. **William K. Southgate** remains assistant to the president in charge of new processes.

—o—

F. R. Royer has assumed the duties of plant manager for the Federal Mogul Corp., Fresno, Calif. He had been chief accountant for the company at both Fresno and San Francisco since 1944, and became full-time production manager at Fresno last March.

—o—

Harold R. Ryan has been named assistant superintendent of the open hearth department of the Indiana Harbor plant, Youngstown Sheet & Tube Co., Youngstown. **Thomas C. Thomas** has retired as superintendent of the Campbell plant, coupling department, of the company, and is succeeded by **S. J. Sferra,** who joined Sheet & Tube 41 years ago.

—o—

Frank W. Jenks, vice president, International Harvester Co., Chicago, has been elected president, Illinois State Chamber of Commerce. Among six new vice presidents are **E. D. Kaser,** president, Durabilt Mfg. Co., Aurora, Ill., and **C. R. Osborn,** general manager, Electro-Motive Division, General Motors Corp., at LaGrange, Ill.

—o—

Joseph A. Galazzi has been appointed chief engineer of the Morrison plant, Liquid Carbonic Corp., Chicago. He had been plant manager of the Constant Temperature Division, American Instrument Co., at Silver Springs, Md.

—o—

Aetna-Standard Engineering Co., Youngstown, announces election of **William Rodder** as vice president in charge of engineering. Mr. Rodder has been in Aetna-Standard's engineering department for 18 years, and has been chief engineer for the past nine years.

—o—

Forest L. Henderson has been elected executive vice president and a director of American Cable & Radio Corp., affiliate of International Telephone & Telegraph Corp., New York.

—o—

Neil C. Reed has been appointed eastern district manager of the Westinghouse Elevator Division, Westinghouse Electric Corp., Pittsburgh. He succeeds **Robert H. Wagner,** who has become Pacific Coast district manager of the division, with headquarters in San Francisco. Mr. Reed will direct sales and installations of elevators and electric stairways throughout New York state and northern New Jersey.

—o—

Walter J. Hogan has joined the staff of Roll Formed Products Co., Youngstown. He had previously been connected with the Van Huffel Tube Corp., Warren, O., and had also been associated with United Tube Corp., Cleveland, specializing in section and shape tool designing.

—o—

The Worthington Pump & Machinery Corp., Harrison, N. J., has appointed **Edwin A. Murray** and **Howard M. Boteler** as assistant managers of the Compressor Division in Buffalo. Mr. Murray will be in charge of industrial and government compressor business, and Mr. Boteler will be in charge of oil refinery and chemical compressor business.

—o—

David B. Hill has been appointed district field engineer in the Atlanta office of Chain Belt Co., Milwaukee. Previously he had been an application engineer in the company's Conveyor Division at Milwaukee.

—o—

Addison E. Wiles, assistant manufacturing manager of the Plastics Division, General Electric Co., Schenectady, has been appointed manager of the Pittsfield, Mass., molded products works to succeed **Arthur C. Treece,** who has been named assistant manager of the new G-E plastics laminating plant at Coshocton, O.

—o—

H. A. Grove has joined the Atlantic Steel Co., Atlanta, as metallurgical engineer. He comes to Atlantic from Republic Steel Corp., Cleveland, where he specialized on stainless steel sheet and strip production, and held the position of mill metallurgist on alloy flat products. During the war Mr. Grove devoted most of his time to tank and light armor plate, and served as assistant director of the super alloy branch of the Steel Division, WPB.

H. A. GROVE

—o—

W. C. Gemperline has been appointed manager of the Atlanta office of Wheeling Corrugating Co., Wheeling, W. Va., to succeed **E. C. Schaaf,** who has retired because of ill health.

—o—

Bern Dibner has been elected president of Burndy Engineering Co., New York, to succeed the late **Philip Fried.** Mr. Dibner has been vice president and general manager of the company.

—o—

C. H. Linder has been appointed assistant manager of manufacturing for the apparatus department, General Electric Co., Schenectady, N. Y. He has been assistant manager of the Schenectady Works since 1943.

—o—

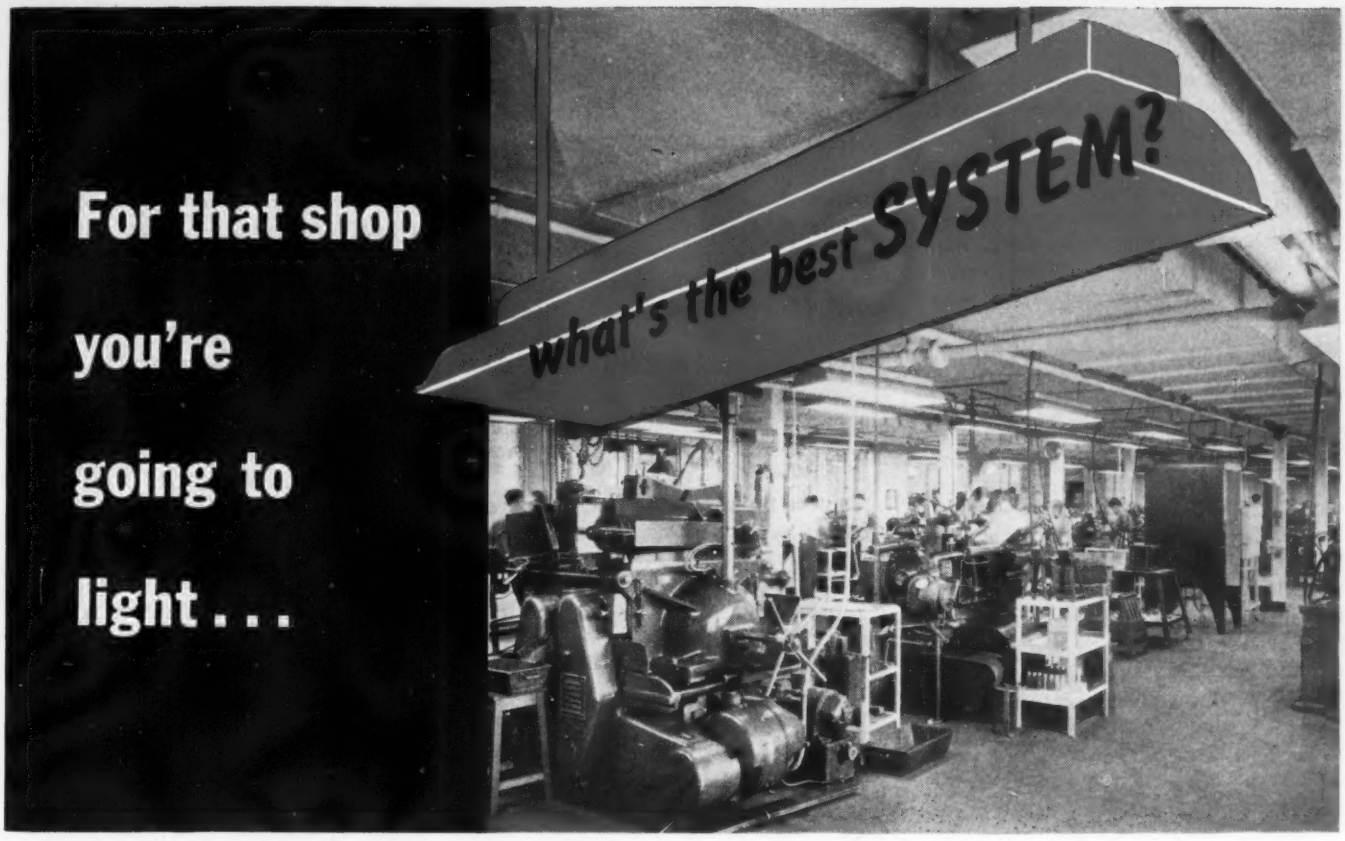
Northern Ohio Chapter, Institute of Scrap Iron & Steel Inc., has elected a new ten-member executive committee. Its members are: Chairman, **Abner L. Cohen,** Cohen & Son Co., Cleveland; **Paul Hamel,** By-Products Iron & Steel Corp., Cleveland; **Browne Shapero,** Max Freidman Co., Cleveland; **Harry Lederer,** Lederer Iron & Steel Co., Cleveland; **Maurice Kline,** State Metals & Steel Co., Canton, O.; **Abe Knoffsky,** Warren Scrap Iron & Metal Co., Warren, O.; **Sam H. Urdang,** A. Shaw Co., Cleveland; **Samuel Gluck,** Consolidated Steel Co., Youngstown; **S. H. Schachtel,** Philip W. Frieder Division, Cleveland; and **Lewis Miller,** Columbia Iron & Metal Co., Cleveland.

—o—

Stuart M. Jones, sales manager of New York Wire Cloth Co., New York, has been elected president of the Insect Wire Screening Bureau, New York. **Herman J. Blaser,** vice president of Keystone Wire Cloth Co., Hanover, Pa., and of its parent corporation, Seneca Wire & Mfg. Co., Fostoria, O., has been named vice president of the bureau, and **Ralph W. Bacon** continues as secretary.

—o—

William E. Simons, formerly sales manager, Truck Body & Hoist Division, Heil Co., Milwaukee, has been appointed manager of that division, as well as the Road Machinery & Service Divisions. He will continue as sales manager of the Truck Body



GraybaR can help you choose and apply it

Whatever your lighting requirements, Graybar can impartially recommend the exact lighting equipment for your particular needs from the most complete selection of lamps and lighting units available from any one source.

For general, local, or product illumination — indoors or outdoors — Graybar can provide you or your electrical contractor with the latest, most suitable fixtures and matching G-E lamps — plus the wire, transformers, switches, and ballasts you need. The Graybar Lighting Specialist near you can aid in applying them most efficiently.

If you use lamps in sizeable quantities, a Graybar Lamp Contract will relieve you of all lamp-buying details and save you money.

Our national warehousing system can simplify your procurement of "everything electrical". For some items, demand still exceeds supply — but many of the things you need are immediately available from our local stocks. Call our nearest office. *Graybar Electric Company. Executive offices: Graybar Building, New York 17, N. Y.*

Want your order filled by our stockholders?

Whenever you order anything electrical from Graybar, your requirements *do* receive the personal attention of our stockholders. Graybar is wholly owned by its operating and retired personnel. That's one reason why Graybar people—together forming a huge, nation-wide organization—apply to each job the sense of personal responsibility you associate with a small, well run, *local* business.

4790

Via GraybaR
... convenient source of 60,000 electrical items

IN OVER 90 PRINCIPAL CITIES

WIRING • LAMPS and LIGHTING • COMMUNICATION • SIGNALING • VENTILATION • CONTROL • POWER APPARATUS • TOOLS

& Hoist Division, **Dan Pierce** as sales manager of the Road Machinery Division, **Charles B. Tamm** as manager of the Field Service Division, and **James Nelson** as manager of the parts department.

—o—

Robert G. Page, general counsel of Phelps Dodge Corp., New York, has been elected president of the corporation to succeed **Louis S. Cates,** who has been elected chairman. Mr. Cates, president for the last 18 years, will continue as chief executive officer.

—o—

Thomas F. Gessner has been appointed advertising manager of United States Radiator Corp., Camden, N. J., and of its division, the Pacific Steel Boiler Corp.

—o—

Walter R. Grant has been elected treasurer of Hotpoint Inc., an affiliate of General Electric Co., Schenectady, N. Y., to succeed **George W. Scotot,** who has been secretary and treasurer since 1933. Mr. Scotot has been elected vice president and secretary of the company. Mr. Grant previously had been treasurer of Locke Insulator Co., Baltimore, an affiliate of General Electric.

—o—

Globe Steel Tubes Co., Milwaukee, announces the appointment of **Frederick K. Krell** as Chicago district sales representative. He has been with the company since 1942, serving in the capacity of sales service supervisor.

—o—

Alfred E. Barton, formerly assistant treasurer of Willys-Overland Motors Inc., Toledo, O., has been elected vice president and treasurer of Graham-Paige Motors Corp., Willow Run, Mich.

—o—

William Clausen has been appointed manager of operations for Farnsworth Television & Radio Corp., Fort Wayne, Ind. He formerly had been vice president and general manager of Victor Products Corp., Hagerstown, Md.

—o—

E. R. Ordway has been appointed general manager of the new Kaiser & Frazer Rolling Mill Division at Indianapolis, formerly Chapman-Price Steel Co.

—o—

Robert Maynard, export sales manager, Osgood Co. and General Excavator Co., Marion, O., has returned from a tour of the principal markets of Central and South America and the West Indies, where he made a survey of the market for earth-moving and material handling equipment, and contacted owners of Osgood and General power shovels and material handling equipment.

—o—

American Chain & Cable Co. has announced that **V. E. Lysaght** has assumed direction of the sales of Andrew C. Campbell Division, succeeding **R. J. Southwell,** who has resigned. For several years Mr. Lysaght has been in charge of engineering and sales of "Rockwell" and "Tukon" hardness testers, manufactured by Wilson Mechanical Instrument Co., an associate company of American Chain & Cable Co., and he will continue his duties with that company.

—o—

R. B. Scott has been appointed general accountant, United States Steel Corp., New York. He succeeds **S. P. Smail,** who has been elected comptroller and a director of the American Bridge Co., a subsidiary, to succeed **F. D. Colburn,** resigned.

—o—

David J. Foran has been appointed to the newly-created position of sales manager of the Titusville, Pa., Boiler Division, Struthers Wells Corp., Warren, Pa. He formerly was manager of the heating department of the Crane Co., Buffalo.

—o—

Clarence F. Shaffer has been appointed manager of Cleveland sales and service branch, Pitney-Bowes Inc., Stamford, Conn., manufacturer of postage meters and mailing machines for government and business. He succeeds **A. L. Lawrence,** resigned.

—o—

Herbert Kaufman has been retained as consultant for the direction of advertising, public relations and sales promotion activities by Palm, Fechteler & Co., New York.

—o—

William H. Ivey, formerly head of the State Department of Labor, and later labor relations manager for Bechtel-McCone Corp., at Birmingham, has opened an office as industrial relations consultant at Birmingham.

—o—

The American Arbitration Association announces the appointment of **George N. Butler** as director of international arbitration, and executive secretary of the Inter-American Commercial Arbitration Commission.

—o—

J. W. Schwalbach has been appointed purchasing agent of the Barcalo Mfg. Co., Buffalo, succeeding **George D. Rutherford,** who is retiring after 44 years with the company.

—o—

F. William Kahrl has been appointed controller, Cooper-Bessemer Corp., Mt. Vernon, O. He assumes the position formerly held by **James E. Brown,** who was named treasurer to succeed **Zenno E. Taylor,** retired.

—o—

Appointment of three new regional sales managers is announced by the Rapids-Standard Co. Inc., Grand Rapids, Mich. **S. C. Tom Lloyd** is manager, southwestern region; **John Kramer,** midwestern regional sales manager; and **Plin Mears,** western regional sales manager.

—o—

Mechanical Handling Systems Inc., Detroit, announces opening of a district sales and engineering office in the Keith Bldg., Cleveland, to serve northern and central Ohio. **Robert P. Petersen** has been appointed district manager. He formerly had been Cleveland manager for New Departure Division, General Motors Corp., Detroit.

—o—

Dr. James J. Pyle has been elected a director of the Locke Insulator Corp., subsidiary of General Electric Co., Schenectady, N. Y. He is the director of General Electric's Plastics Division laboratory at Pittsfield, Mass.

—o—

James E. Brown has been appointed assistant to vice president-supervisory personnel, American Steel & Wire Co., a U. S. Steel Corp. subsidiary. **Paul C. Harrison** has been named works superintendent, Newburgh Wire Works, a company plant at Cleveland, to succeed Mr. Brown.

—o—

L. Paul Ahlers, director of sales, Ranger Aircraft Engines Division, Fairchild Engine & Airplane Corp., Farmingdale, N. Y., has been promoted to the post of assistant to the general manager of the division, and **S. G. Nordlinger,** chief of unconventional power plants engineering, same division, has become director of sales. **Eric Preece,** formerly with Curtiss-Wright Corp., New York, has joined the Ranger Division as product engineer.

—o—

H. A. Gehres, Cooper-Bessemer Corp., Mt. Vernon, O. and Grove City, Pa., has been named executive vice president. He has been vice president and director of engineering of the corporation. **Ralph L. Boyer,** formerly chief engineer, has been named vice president and chief engineer.

—o—

Murray H. Owen has been appointed manager of sales, Wire & Cable Division, General Electric Co., Schenectady, N. Y. His new position in-

JACK L. ASHBY

Appointed vice president and assistant general manager, Iron & Steel Division, Kaiser Co. Inc., Oakland, Calif. STEEL, Oct. 6, p. 97

ELMER E. ISGREN

Has been appointed vice president in charge of production for LeTourneau Inc., Peoria, Ill. Noted in STEEL, Oct. 6 issue, p. 96

PAUL J. MOORE

Appointed director of sales and engineering, Crocker-Wheeler Electric Mfg. Co., Ampere, N. J. Noted in STEEL, Oct. 6 issue, p. 97

cludes his former duties as manager of sales of the York Wire & Cable Section, as well as the duties of **A. E. Newman,** formerly manager of sales of the Bridgeport, Conn., Wire & Cable Section. Mr. Newman has retired after 37 years' continuous service with the company. **D. M. Daley** has been appointed representative for the company's tungar and metallic rectifiers in the Great Lakes district.

—o—

Dr. W. A. Pennington, chief chemist and metallurgist of the Carrier Corp., Syracuse, N. Y., has been named winner of the Henry Marion Howe Medal for 1947, awarded annually by the American Society for Metals.

—o—

C. W. Bliss has been appointed controller of Warner & Swasey Co., Cleveland. **Helen Heinmiller** has been appointed assistant secretary.

—o—

Charles T. Marsh has been appointed sales representative of Acro Welding Mfg. Co., Milwaukee. He will cover Wisconsin and Illinois, with headquarters in Chicago.

—o—

F. Marion Drake has been appointed general sales manager of the New York branch of Frigidaire Sales Corp., General Motors Corp. subsidiary.

—o—

Young Radiator Co., Racine, Wis., has appointed **William E. Becker** as purchasing agent in charge of procurement requirements for the company.

OBITUARIES . . .

A. G. Bussman, 61, of the Wickwire Spencer Steel Division, New York, the Colorado Fuel & Iron Corp., died Oct. 7. He was long associated with the steel industry. He started his career in the Homestead Plant of Carnegie Steel in Homestead, Pa. Before his connection with Wickwire Spencer Steel Co., Mr. Bussman was chief chemist of the Donora Steel Works of the American Steel & Wire Co., and president of the Standard Steel & Wire Co. of Greensburg, Pa. Associated with the Wickwire Spencer Steel Co. since 1931, he was successively manager of the wire and spring department, sales manager of the Buffalo district, assistant to the president and general sales manager. At the time of his death he was in charge of sales of the Wickwire Division.

—o—

Carl A. Shannon, 67, president, Great Lakes Supply Corp., Chicago, died Oct. 9 in that city. He was a past president of both the National Supply & Machinery Distributors Association, and the Central States Mill Supply Association, and a director of the Chicago Steel & Wire Co., Chicago.

—o—

Cecil W. Machon, 69, general sales manager and assistant secretary, Brown & Sharpe Mfg. Co. Inc., Providence, R. I., died suddenly at his home in that city Oct. 11. Mr. Machon also was president of the two company subsidiaries, Brown & Sharpe Co., a West Coast sales organization, and Brown & Sharpe of New York Inc., which handles sales in the New York territory. He was in his 50th year of service with the company, having started his association in 1898.

JOSEPH L. TRECKER

President, Kearney & Trecker Corp., Milwaukee, died Oct. 7, as noted in STEEL, Oct. 13 issue, p. 55. Mr. Trecker died at his desk of a heart attack. He was 45 years old

—o—

William T. Shaler, 73, since 1935 consulting engineer with Ajax Flexible Coupling Co. Inc., Westfield, N. J., died recently at his home in Silver Creek, N. Y.

—o—

James P. Van Dorn, who retired 20 years ago as vice president of the Van Dorn Iron Works, Cleveland, died Oct. 14 after a heart attack.

—o—

Conrad Stellrecht, 78, president and treasurer of the Stellrecht Machine Corp., Buffalo, died Oct. 6 in that city. He also was a vice president and a director of the National Grinding Wheel Co., North Tonawanda, N. Y.

—o—

W. H. Phillips, 60, vice president, Molybdenum Corp. of America, Pittsburgh, died in that city Oct. 10.

Stability of Steel At Elevated

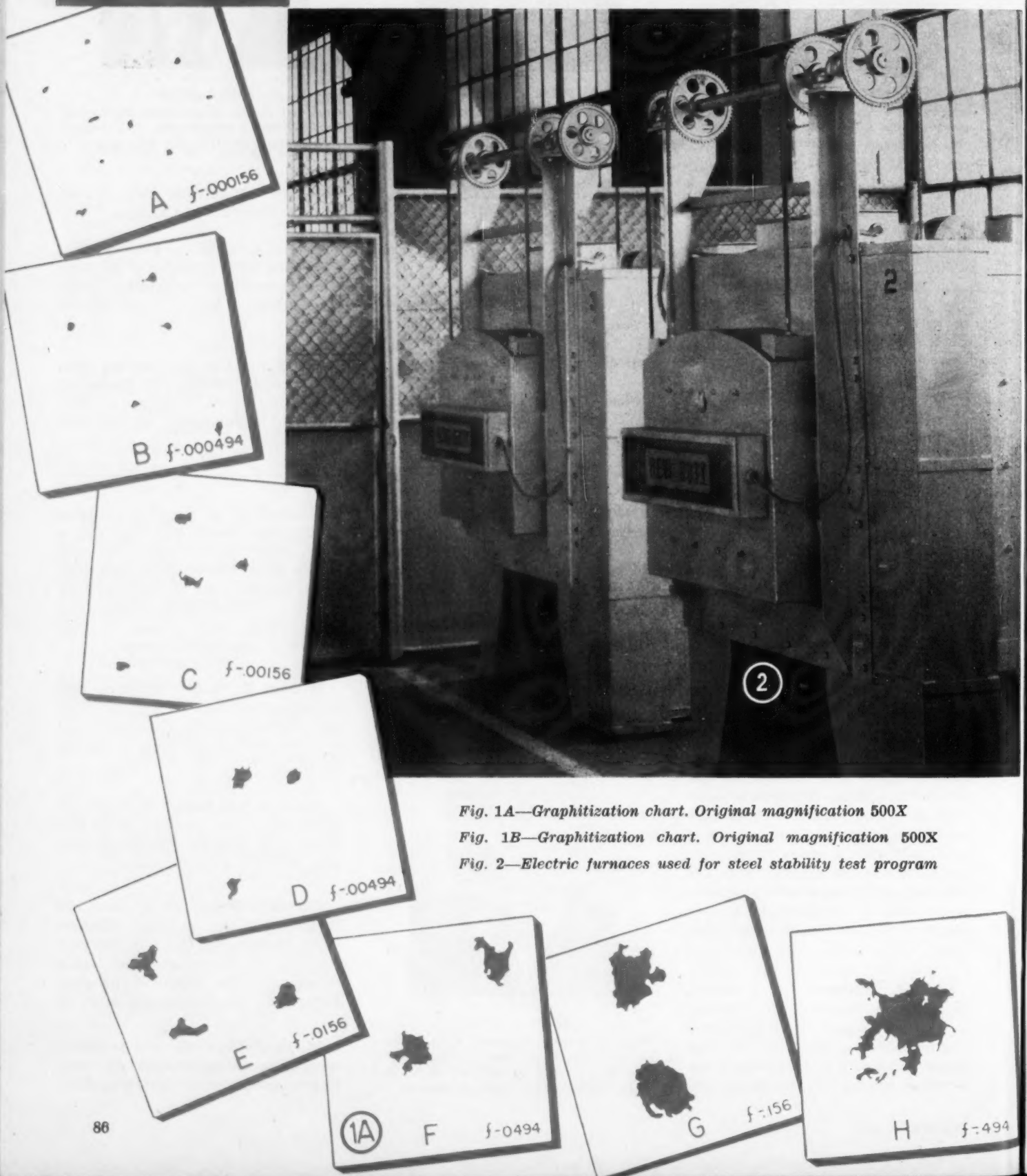


Fig. 1A—Graphitization chart. Original magnification 500X

Fig. 1B—Graphitization chart. Original magnification 500X

Fig. 2—Electric furnaces used for steel stability test program

The authors outline scope of an extensive research program being conducted on high temperature piping materials. Investigation will extend over a period of 11 years

Temperatures

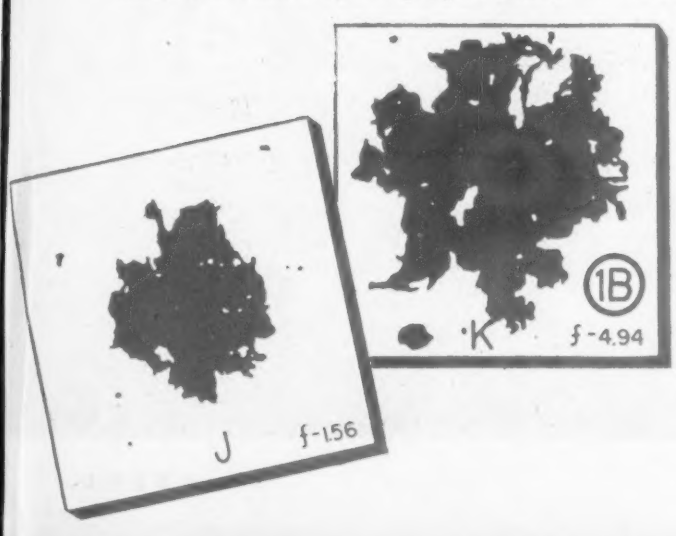
By A. B. WILDER
Chief Metallurgist
National Tube Co., Pittsburgh
and
J. D. TYSON
Chief Metallurgist
National Tube Co., Lorain, O. Works

MANUFACTURERS have supplied seamless steel pipe for many years for use at elevated temperatures in steam power plants. When seamless first began to be used, operating temperatures and pressures were relatively low and the steel then produced adequately met the existing requirements. Creep properties were unknown and "graphitization" was a term metallurgists associated with cast iron.

As higher temperatures and pressures came into use, carbon-molybdenum steel was developed to meet these conditions. Steel of this type was originally made with a small grain size in accordance with the prevailing specification. Studies of the creep properties of carbon-molybdenum steel developed information which indicated that a coarse grain steel had superior creep properties.

Accordingly, in 1939, steel specifications for high temperature service were correspondingly changed. It now appears most fortunate for the high temperature piping users that this change preceded by approximately 4 years the discovery of graphitization in power plant piping. This revelation caused the power interests and steel makers alike considerable concern and both co-operated closely in reviewing heat histories and melting practices relating to piping already in service. In addition, an effort was inaugurated to develop a new type of steel with less susceptibility to graphitization. This applied particularly to the heat-affected zone of welds, as welded construction had been almost universally adopted.

Since the discovery of graphitization in 1943, independent investigations have been conducted by a number of laboratories which have resulted in a better understanding of the problem. National Tube Co., a large producer of seamless pipe for high temperature high pressure service, maintains a close interest in the subject, supplying pipe samples to many independent investigators. In 1943, this company made plans for a research program involving a study of the properties of a large number of steels at elevated temperatures. Considerable progress has been made to date; it is the purpose of this article to familiarize those interested in this subject with the nature of the program.



The object of this investigation is to determine structural characteristics and certain properties of a large number of steels after exposure at elevated temperatures for various time periods up to 11 years. It is not the purpose to determine physical or chemical causes for graphitization in steel or to establish a theory of graphitization kinetics. This work is being done by several other laboratories. The investigation consists of metallographic studies of structural changes with particular emphasis on graphitization characteristics of seamless material, both welded and nonwelded, and creep rupture tests, scale loss measurements, hardness and impact properties in nonwelded material.

Although the investigation is primarily designed to determine the grades or chemical compositions of steels which afford greatest resistance to graphitization with retention of favorable creep rupture characteristics, it is recognized that other factors influence the results obtained. It has been shown, for example, that deoxidation practice, preliminary heat treatment, stress in service and welding conditions all may be effective.

These factors, with the exception of service stress, therefore, were given consideration in the program with sufficient variations so that independent effects could be determined. Stress is not being imposed during the exposure of the steel specimens at elevated temperature. The complication in introducing this variable and its poor relationship to actual service conditions can be realized. Some measure of the influence of stress will be obtained in the creep-rupture testing.

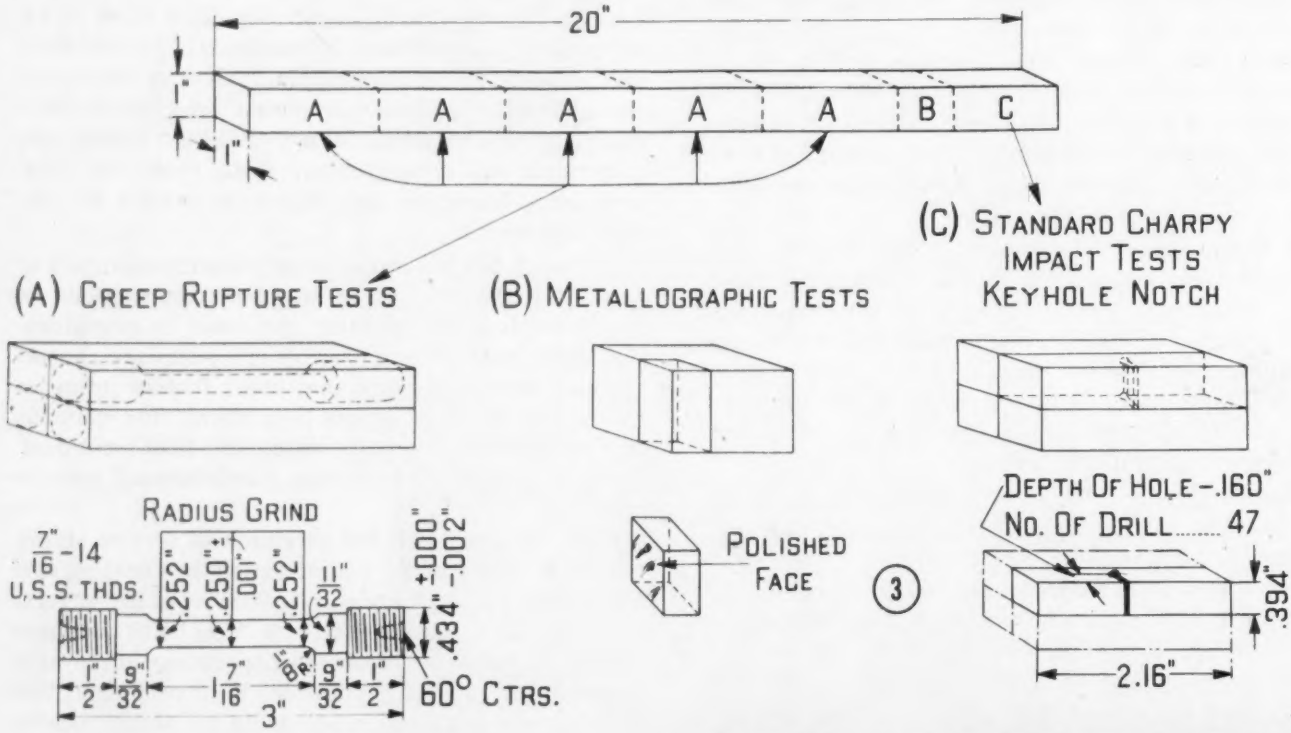
Considering the long term nature of the program, the laboratory research work has been supplemented with a co-operative program which is being sponsored by Consolidated Gas, Electric Light and Power Co., Baltimore. In this program, commercial lengths of 10 3/4-inch OD x 1.125-inch wall, 0.5 chromium, 0.5 molybdenum pipe made with both coarse and fine grain deoxidation practice in the electric furnace have been furnished for service and fabrication testing. In one of the heats, no aluminum was used in the deoxidation practice and in the other heat 1.25 pounds of aluminum per net ton of steel was added to the ladle. Creep studies and fabrication testing were completed and actual service tests are in progress. In addition to the service tests, welded sections of pipe are being exposed at temperatures of 1025 and 1100° F in the laboratory. These were metallic arc welded under field welding conditions with 0.5 chromium, 0.5 molyb-

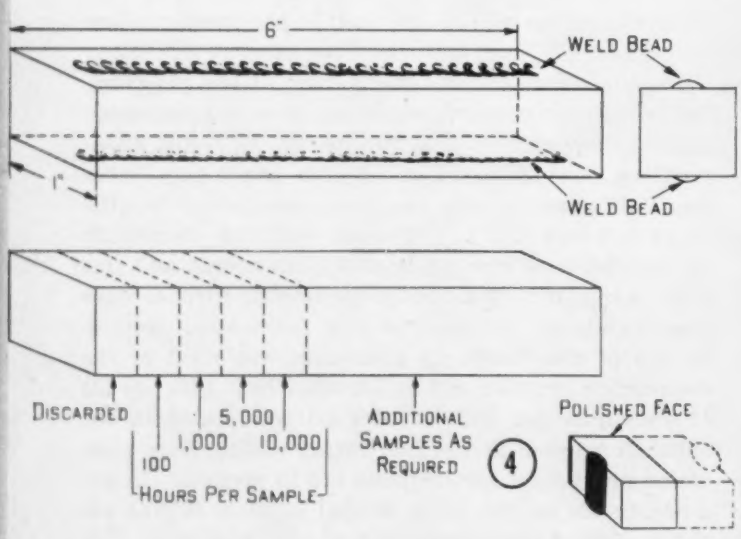
denum welding rod. Preheating and stress relieving treatments were used.

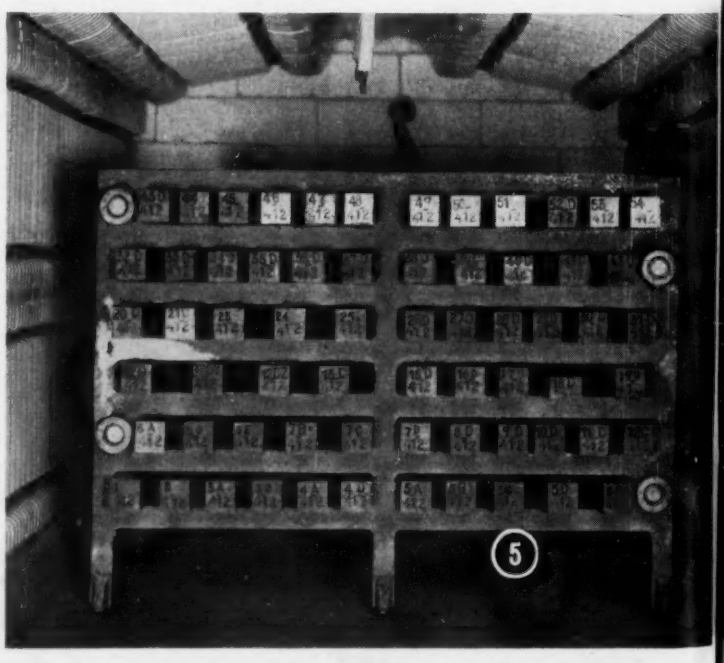
A total of 60 different steel grades involving 82 structural conditions are included in the program. Approximately 20 additional steels will be added in the near future. The steel grades being studied are shown in accompanying table. Steels included in the program were obtained from a number of different sources, as most of the material required was not available in heavy wall seamless pipe. A number of the steels were melted in an induction furnace. Most of them, however, were made according to regular commercial practice in either the open hearth, electric furnace or bessemer converter. Consideration of variables, such as chemical analysis, steel making methods, deoxidation practice and heat treatment is included in the investigation.

Most of the bar samples were obtained from forged sections, and it was necessary, therefore, to heat treat the bars to eradicate structural nonuniformity expected in the forged condition. The low carbon, low alloy steels were normalized and drawn or annealed. Stainless steels were heat treated in accordance with commercial practice. Heat treatment was varied in several grades in order to evaluate the influence of prior structure on carbide stability. Hot rolled and stress relieved sections of pipe were also included so that a comparison could be made with the forged and heat treated steels.

Each steel was forged from an ingot or billet or cut from heavy wall pipe to 1-1/8-inch square bars. The bars were machined and surface ground to 1-inch squares. A description of the welded and non-welded specimens is shown in Fig. 4. Location of the







various test specimens to be taken from the 1 x 1 x 20 inch test bar is illustrated in Fig. 3. As many as 20 creep-rupture specimens are available, and in cases of severe surface decarburization a minimum of five creep rupture specimens can be obtained. Method of sectioning for metallographic examination and location of Charpy impact specimens are also indicated.

In the field welding of pipe, a multiple-layer, metallic arc buttweld is used. Conditions set up in the weld and heat-affected zone depend upon a number of factors including thickness of material, heat treatment and welding technique. From a laboratory point of view, the weld bead test has been developed. This affords a simple means for determining the effect of welding on carbide stability, particularly in the heat-affected zone of the weld. Two weld beads of different heat input were laid on opposite sides of a 1 x 1 x 6-inch test bar as illustrated in Fig. 4.

The large bead was deposited with a 3/16-inch electrode using 180 amperes welding current and the small bead with 1/8-inch electrode using 100 amperes welding current. Carbon and austenitic alloy steels were not preheated or postheated. The ferritic alloy steels with the 3/16-inch electrode were preheated to 500° F and postheated 1200° F for 1 hour after welding. All bead welds were made at the U. S. Steel Corp. research laboratory with automatic welding equipment.

Exposure Furnaces: Three box-type electric furnaces were provided for exposing the test samples at 900, 1050 and 1200° F. The furnaces were heated on six sides. Special precautions were necessary to insure close temperature uniformity and control. Tap changing transformers were installed to distribute current among the furnace side heating elements. Three independent means of excess temperature control were provided: (1) Control thermocouple with automatic Micromax temperature control recorder, (2) control thermocouple with excess temperature cutout indicator, and (3) master tap changing transformer set to permit only 10 to 15° F overshoot if the other two controls failed. An alarm system is attached to the excess temperature cutout indicator. The 2 x 5 x 1-1/2 foot heating chambers of all furnaces were surveyed and found to be within plus or minus 7° at the operating temperature.

To control the scaling tendency, furnaces are sealed to reduce air infiltration and excessive circulation. Figs. 2 and 6 show the furnaces and control panel used in this work. Method of loading samples into furnaces is illustrated in Fig. 5. A heat resisting loading rack of welded construction is used.

Exposure times for the 1 x 1 x 20-inch bars, Fig. 3, at each of the three exposure temperatures (900, 1050 and 1200° F) were planned for 1000 hours, 10,000 hours and 100,000 hours. The 1 x 1 x 6-inch bars, Fig. 4, will be sectioned after each of the above time periods, but will be returned after each time cycle to their respective furnaces for further exposure. Sections have been removed from the welded bars at the end of 100, 1000 and 5000 hours, and as the program progresses, more tests will be obtained within the 10,000 to 100,000 hour interval.

Hardness and Impact Tests: Rockwell B hardness and standard size Charpy keyhold notch impact tests are being made on all steels before and after elevated temperature exposure. Tests have been completed before and after exposure at 900, 1050 and 1200° F for 1000 hours, but it is felt that the results should not be reported until after the 10,000-hour cycle is available, even though some rather definite trends in these properties already appear to be in evidence. As indicated in Fig. 3, four impact tests are available from each test bar. Two are being tested at room temperature. The remaining two samples are being held for later testing at another temperature. The type of fracture obtained while breaking impact specimens is being observed and recorded. Rockwell B hardness tests are being made on the sides of impact test specimens which have been surface ground.

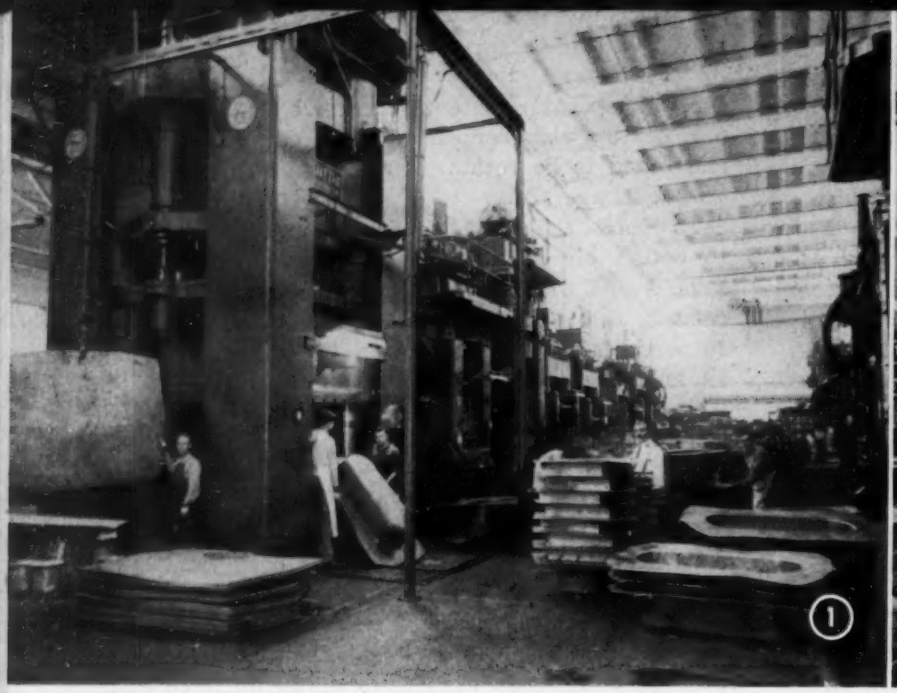
U. S. Steel Corp. research laboratory is making a study and will report results on the influence of exposure at elevated tem- (*Please turn to Page* 108)

Fig. 3—Location of specimens in exposure bar

Fig. 4—Welded test bar

Fig. 5—Method of loading test bars in electric furnaces

Fig. 6—Temperature control panel for electric furnaces



PRESS-S

ONE of the most interesting operations in the plant of the Norris Stamping & Mfg. Co., Los Angeles, is that involving the production of steel bath tubs for Sears, Roebuck & Co. This is one of the major items now being produced in the Norris plant, others including stainless steel beer barrels, automobile wheels, washing machine tubs and a line of stainless steel utensils for home use.

For bath tubs, Norris purchases 14-gage, vitreous enamel, deep drawing quality, 14-gage cold rolled sheets, 60 x 80 in. in size. These are blanked out in two strikes on a 450-ton crank press. Shape of these blanks may be seen at the left of the 6000-ton Lake Erie press, Fig. 1, used for performing the first drawing operation.

Blanks are coated with a hot plastic drawing compound developed by Norris engineers, the blank in Fig. 1 being ready for dipping in the lubricant. Also, in Fig. 1 workmen may be seen removing the stamping of the sump from the press. This draw is especially severe, the sump being 14 3/8-in. deep.

Fig. 2 shows the stamped sump being removed from a 1500-ton Lake Erie press which trims off excess metal and pierces screw holes for mounting the finished tub.

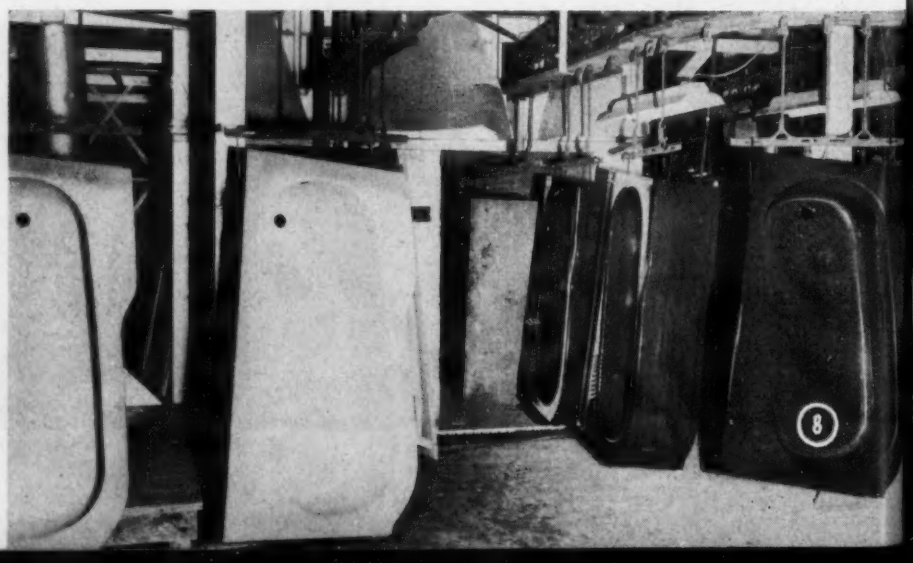
On the third press shown in Fig. 3, a 3000-ton Lake Erie, three operations are performed simultaneously, restriking of the radius, flanging the front rim of the tub downward and flanging the three other sides upward.

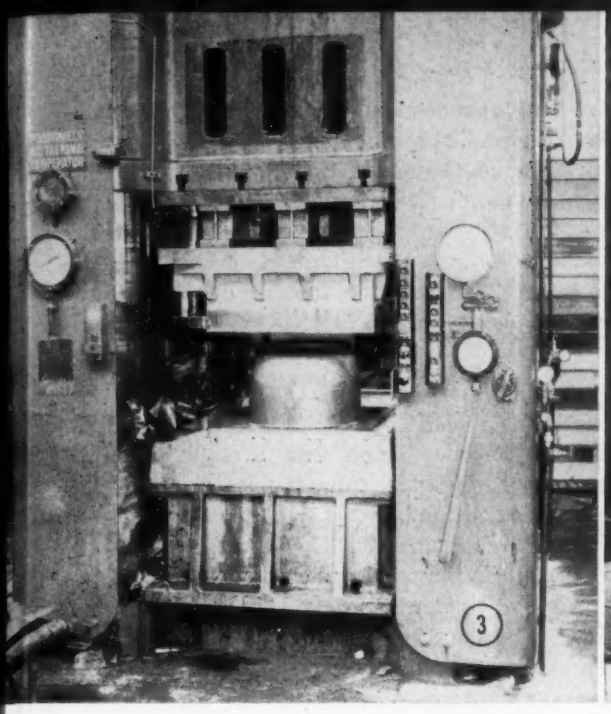
In the next operation, Fig. 4 shows the flange being turned under on the front side. This is done on a 100-ton Williams & White press.

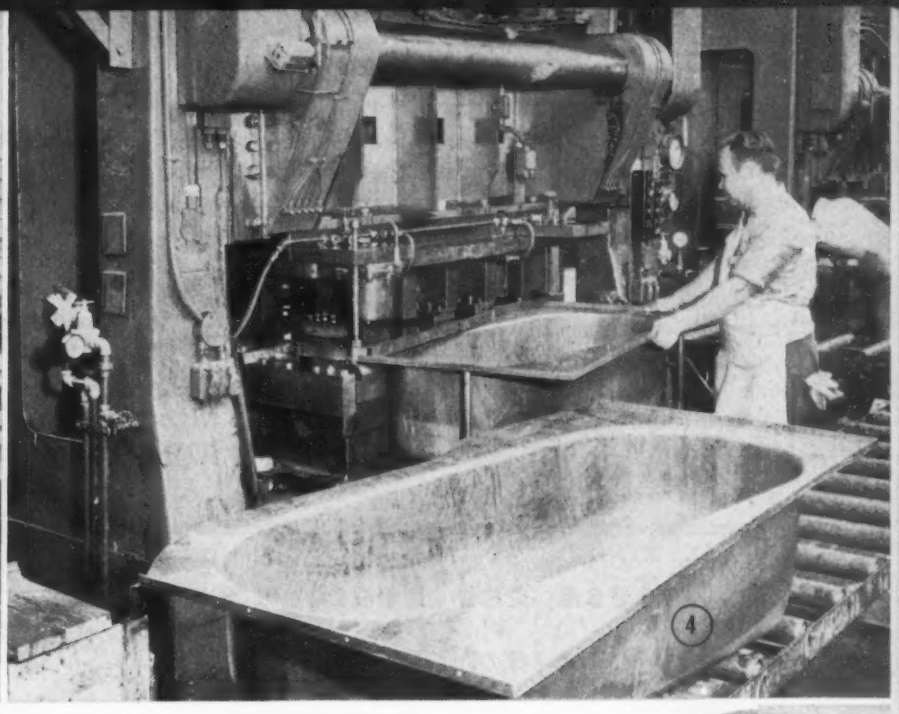
An unusually clever setup is shown in Fig. 5 whereby two distinct operations are performed on vertical and horizontal planes in one stroke of the press. The drain hole is pierced and embossed on the downward movement of the ram. At the same time, the ram actuates a slide for piercing and embossing the overflow hole.

The operator in Fig. 6 is spot-welding the apron to the front of the tub. This flange is 15 x 60 5/8-in. in size and the company buys enameling sheets large enough to make two pieces. Following are the operations in making the flange: (1) Shearing to size; (2) notching all four corners; (3) preliminary forming operation to produce all of the contours and (4) final forming operation in which all four sides are flanged.

Assembly operations are shown being completed in Fig. 7. In the left rear, welders are attaching braces, feet and corner gussets. This is facilitated by a simple jig. The three feet or bottom braces are made in three operations: (1) Blanking and piercing; (2) forming and (3) restriking. Combination dies produce three







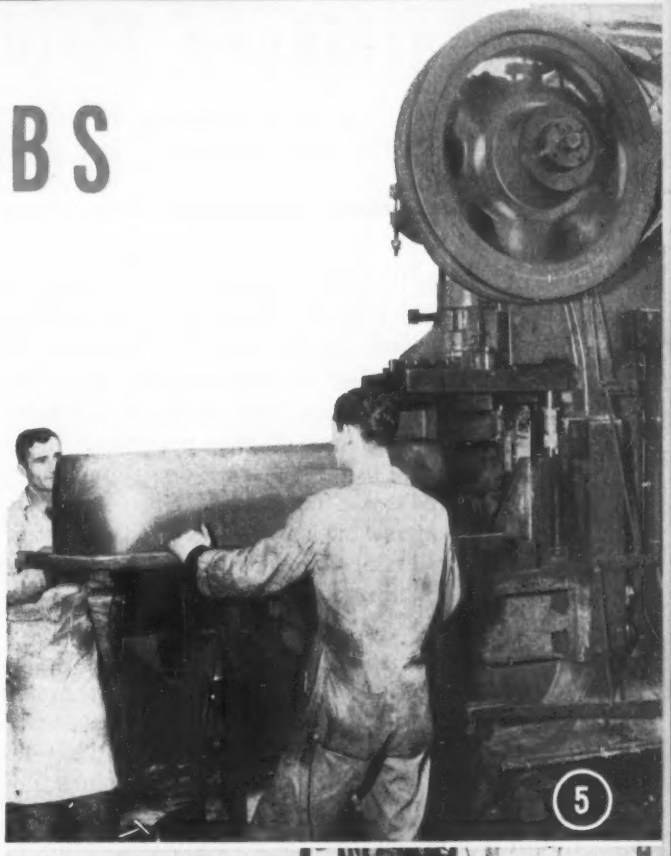
S-SHAPING BATH TUBS

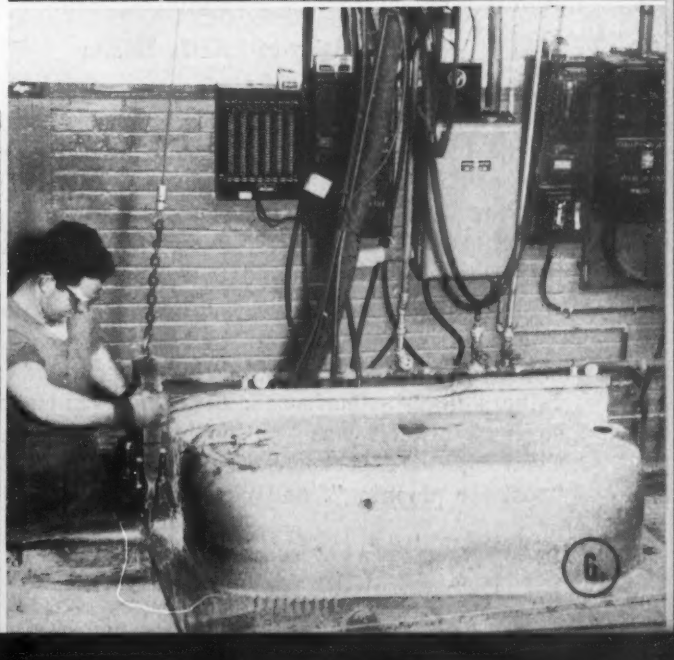
different pieces in one operation. In the foreground, Fig. 7, the completely assembled tub is being touched up with a portable grinder to remove weld marks from the surface.

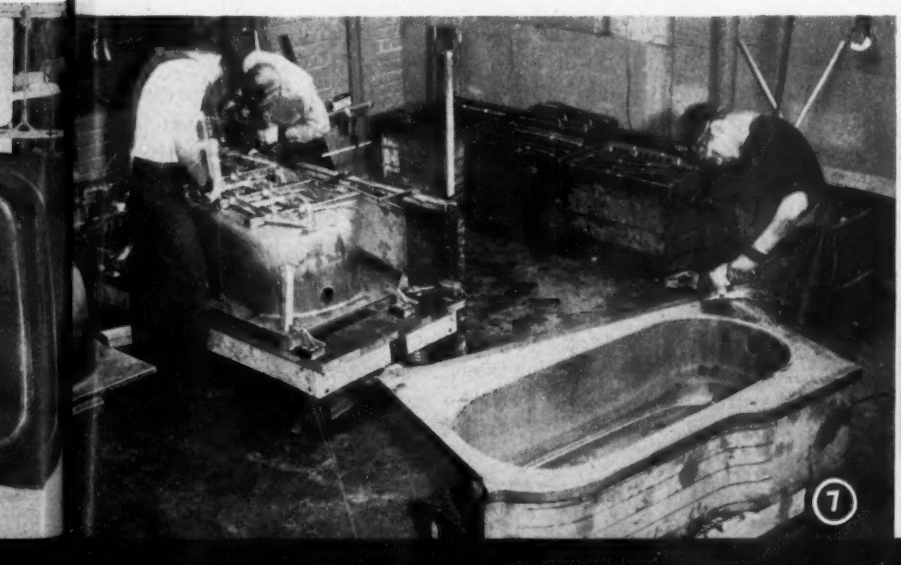
Completed tubs are given an acid pickle and sprayed with ground coat frit. Tubs entering the porcelain enameling furnace at the left in Fig. 8 have just been sprayed whereas those at the right are emerging with the ground coat baked on. An acid-resisting white enamel finish is placed on over the ground coat. Ground coat is fired at 1560° F and the finish coat at 1520° F.

Tubs are carried through the furnace on a single rail conveyor. Every sixth hanger carries a baffle plate to assure proper concentration of heat in the various zones of the furnace.

Finally, the tubs are sprayed on the underside with an asphalt-fiber, sound-deadening material; inspected and crated for shipment.







MEMORIES OF JOE TRECKER: The career of one of the most dynamic figures in the machine tool industry ended prematurely with the sudden death of Joseph L. Trecker, executive vice president, Kearney & Trecker Corp., Milwaukee, on Tuesday afternoon, October 7, 1947, at the age of 45.

Throughout the National Machine Tool Show in Chicago, September 16-26, Joe was one of the busiest men in the huge Dodge-Chicago plant. Not only was he a bundle-of-activity around the large exhibit of his own company, but also he found time to visit practically every other exhibit, to attend meetings and dinners, to give press interviews and to do anything else which he felt would be in the good interests of the show and the machine tool industry.

Joe was no friend of conservatism. As president of the National Machine Tool Builders' Association in 1944-45 (he was one of the youngest, if not *the* youngest of all its presidents), Joe cut much red tape and smashed some traditions. He believed in direct action. That is how he accomplished so many things in such a short space of time in his own company, in wartime Washington, and in the affairs of the Association.

Many of those things were tremendously important to the war effort and if they had not been accomplished with unusual speed, their benefits would have been either lessened or lost entirely. That was true particularly of subcontracting operations on which Joe and his brother Francis concentrated a lot of attention during their Washington sojourn.

New Way-of-Life Is Hectic

Among the large group of us who attended Joe's funeral, there were several who commented sadly upon the fact that by machine tool industry averages, Joe should have had at least 30 years more of active working life. That very well could have been true under the rather leisurely "way-of-life" which used to prevail in the machine tool industry.

Since about 1933, however, a lot of the younger generation of machine tool builders have been working under pressure that their fathers and grandfathers never experienced. First was "industrial recovery", next it was "national defense", then came the toughest experience of all—World War II, then "postwar planning", and now "reconversion" accompanied by ominous economic and ideological rumblings both here and abroad.

Bearing in mind that even the famous "Strenuous Life" of the dynamic Theodore Roosevelt ended suddenly in his 61st year, must we not admit that the human machine—like a machine tool—wears out prematurely when it is run too fast, under too heavy loads, for too long periods?

Seen and Heard in the Machinery Field

By GUY HUBBARD
Machine Tool Editor

THREE DIMENSIONAL VISUALIZATION: In connection with the recent National Machine Tool Show in Chicago, strong evidence was presented of the growing use throughout industry of methods of "solidified visualization".

This took various forms, the most common of which was use of miniature scale models of machines, booth fittings, equipment and even of attendants and visitors, to attain exact previews of individual exhibits. These were used in preplanning of the exhibits for appearance, proper clearance and for audience convenience. Also, they were photographed in true perspective and these photographs were used effectively in magazine advertising and in direct-by-mail announcements weeks before the opening of the big show in the Dodge-Chicago plant.

Many of these scale model setups were real works of art by a new class of professionals who make this sort of thing their business. These people are employed to a constantly increasing extent in building three-dimensional layouts of large industrial plants to study and correct production flow, operational convenience and safety factors. This technique is far ahead of the two-dimensional method with flat cut-outs which has been used to some extent for many years.

Demand for Models Is Rising

Growth of this three-dimensional modeling is reflected in a rising tide of requests from large users of industrial equipment for "solid" scale models of such equipment. Some years ago I attended the national convention of one of the trade associations —at which one thing on the docket was: "Shall we, or shall we not, provide our customers with flat cut-outs to a standardized scale, of the machines which we build?" Debate was lively and some members thought that the proposal smacked of "cutting out paper dolls".

Not long ago I attended another convention of the same group. This time the question was: "Shall we, or shall we not, provide our customers with standardized scale models of the machines which we build?"

Recalling my previous experience, I fully expected to hear lively debate, punctuated with references to "equipment for doll houses", "men who pretend that they purchase toy railroads for their boys", etc. Strange to say, nothing like that happened. It generally was agreed that this model idea has merit. A committee was appointed to draw up concrete suggestions.

Designers of stage settings have known for decades that this system has merit. Apparently industrialists rapidly are coming to the same conclusions.

Forming Steel by

COLD EXTRUSION

Months of research at Heintz Manufacturing Co. have widened range of extrudable steels and developed new aids to expedite and control the German process, discussed here

COLD extruding of steel was developed during the war in Germany to a point where it was in general use in many plants. The fact that cold steel can be made to flow by means of pressure exterted in the same manner as in extruding tin, lead, copper, brass, aluminum, etc., opens up vast possibilities for making parts at greatly reduced cost.

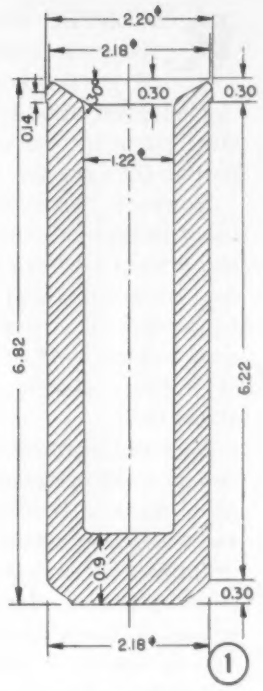
For more than a year, Heintz Mfg. Co., Philadelphia, has been engaged in research on the process, its development and application to governmental and commercial items of manufacture.

Under direction of Heintz engineers, a group of German scientists imported for the purpose has gone much further here in America in perfecting the process than was the case in Europe. These are some of the significant facts about cold extrusion:

Under similar necessity the process could have been readily developed in the United States. The Germans were short on materials and turned to the process as a means of reducing scrap loss to practically nothing.

Heintz uses high speed, mechanical and hydraulic presses ranging from 50 to 2500 tons capacity.

American tool materials already in use in the U. S. give better results than those used by the Germans. Heintz is experi- (*Please turn to Page* 128)



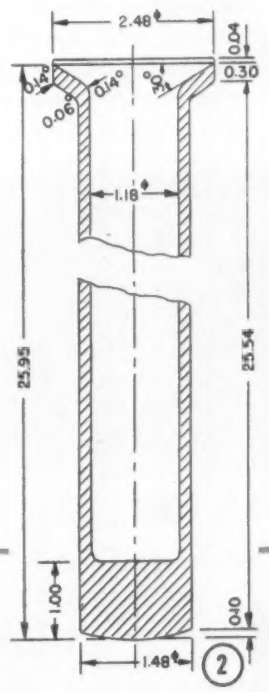
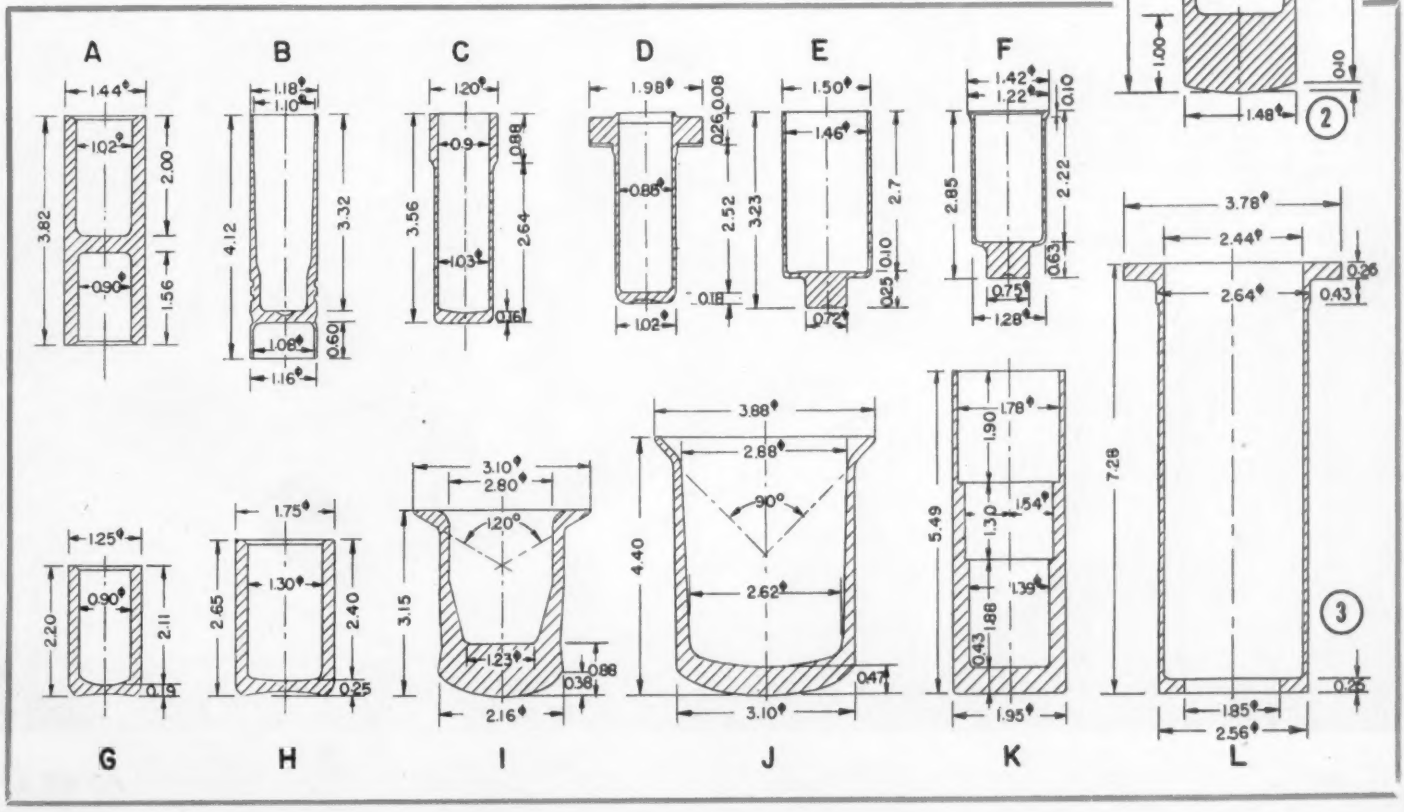


Fig. 1—Cylinder for German airplane landing gear extruded from solid rolled bar. In this stage part is 6 inches long

Fig. 2—Same part, now 25 inches long, cold extruded in one operation

Fig. 3—Examples of other parts cold extruded in Germany. Operations required for parts are: A—2, B—4, C—2, D—3, E—4, F—4, G—2, H—2, I—1, J—1, K—4, L—5



How To Predict Suitability and Determine Method of

Martempering

RECENTLY the metals industry has come to recognize martempering as an excellent method of hardening steel parts. In many cases the superior quality of the martensite produced in steel parts by martempering permits the product to be put into service directly without draw treatment.

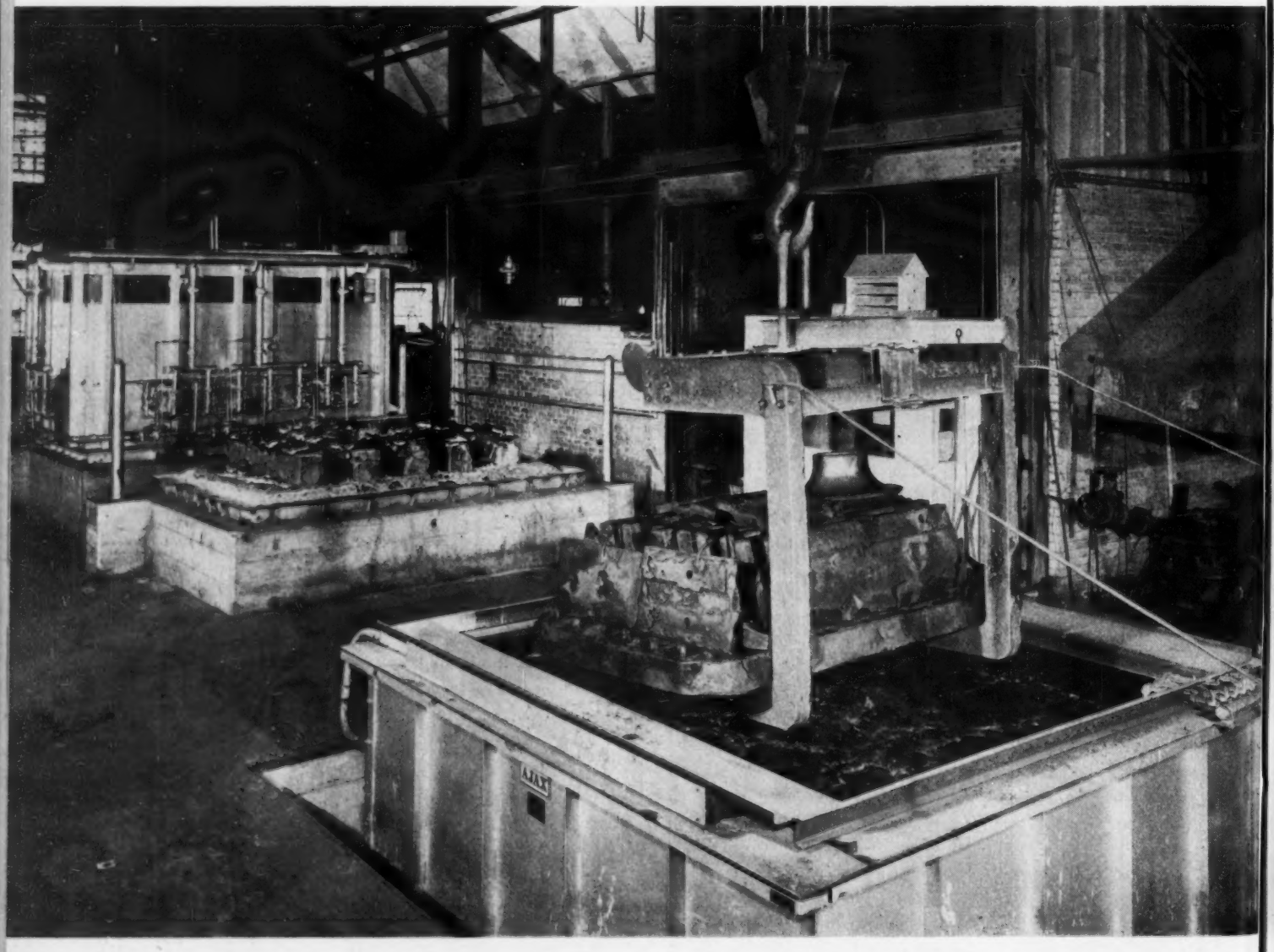
However, this type of heat treatment has its limitations. Indiscriminately prescribed it has already caused many shop foremen and heat-treat supervisors a good deal of grief. Such grief can be avoided and should be prevented. A few simple metallurgical calculations may be employed to achieve success in martempering, or indicate clearly when the method should not be attempted.

It is the purpose of this article to show how technological information may be used in practical shop problems and thereby eliminate costly hours of trial and error experimentation with martempering. The examples given may be employed as guides in approaching many decisions concerned with the use and means of martempering hypoeutectoid steel parts.

It is necessary that the mechanics of martempering be clearly conceived in the reader's mind before dealing with specific details. By way of review, let us briefly consider the martensite transformation in steel because martempering seeks to establish 100 per cent of martensite in the treated part.

If an acceptable understanding is to be gained, it must be assumed that martensite is forming from homogeneous austenite. An inhomogeneous austenite resulting from insufficient austenitizing temperatures or too short a holding time at such temperatures adds considerable complexity to the martensite transformation. Scope of this article therefore necessarily precludes the assumption of a homogeneous austenite.

Important physical characteristic of the martensite transformation to be emphasized here is the volume change which occurs. When the face-centered cubic



In this discussion, the author explains how technological information may be used in practical shop problems eliminating costly hours of trial and error experimentation with this method of hardening steel parts.

Hypoeutectoid Steel

By DON ROSENBLATT

Chief Metallurgist
American Foundry & Machine Co.
Salt Lake City, Utah

structure of austenite is changed to the body-centered tetragonal structure of martensite the same number of atoms must occupy a larger lattice spacing, thus causing appreciable dilation in a given piece undergoing transformation.

If transformation takes place at different rates within a given piece, volume change phenomenon will give rise to high residual stresses within the piece. The martensite transformation does not embody a diffusion of carbon, but merely a change in lattice structure, and for all practical purposes may be considered as a function of temperature only. This is an important difference from a nucleation and growth type of transformation which is a function of both temperature and time at temperature. Time factor in martensite formation is influential insofar as it controls temperature.

Since the formation of martensite is a function of temperature, it is possible to locate the exact temperature for a given steel at which martensite will begin to form. Such a temperature is known as the "Ms" temperature of the steel and may be quite accurately calculated from composition by using the formula in Table I.

When a steel in the austenitic state reaches the Ms temperature it does not immediately transform to 100 per cent martensite. In fact, at the Ms only a very small amount of martensite forms, and continued time at the Ms temperature will not increase the percentage. Such a situation exists because each bit of martensite that forms lowers Ms of the remaining austenite. Therefore martensite actually forms through a range of temperatures.

When the transformation is virtually completed the steel will have reached a specific temperature known as the "Mf" temperature. Grange and Stewart[1] have shown that such a range may be adapted to mathematical equations, and that at any given temperature between the Ms and Mf points the percentage of martensite formed may be calculated when the Ms and the carbon content of the steel are known. The equations are conveniently presented in Table I in form of a nomograph.

If 100 per cent martensite is to be formed in a given steel the subcritical decomposition of austenite into products other than martensite must be avoided. Fortunately, the other products which form, namely pearlite and bainite, are a function of both time and temperature. If the Ms point is reached rapidly enough from the critical temperature neither pearlite nor bainite will form. Time necessary for the formation of either pearlite or bainite, like the Ms temperature, is related to composition and may be calculated therefrom.

Alloys in general, and carbon content in increasing amounts suppress pearlite and bainite and lower the Ms temperature. It may be readily seen that a high alloy steel could be cooled at a relatively slow rate from the critical and still remain austenitic. However, the Ms would be depressed to an impractical temperature, more so the Mf, so that it would be exceedingly difficult to form 100 per cent martensite under ordinary conditions.

Martempering seeks to accomplish a uniform transformation throughout the piece being treated. Temperature gradients beween the surface and center must be at a minimum. To do this sufficient time must be allowed in the quenching medium for the part to approach equilibrium. The time must not, however, be so long as to permit the decomposition of austenite into pearlite or bainite.

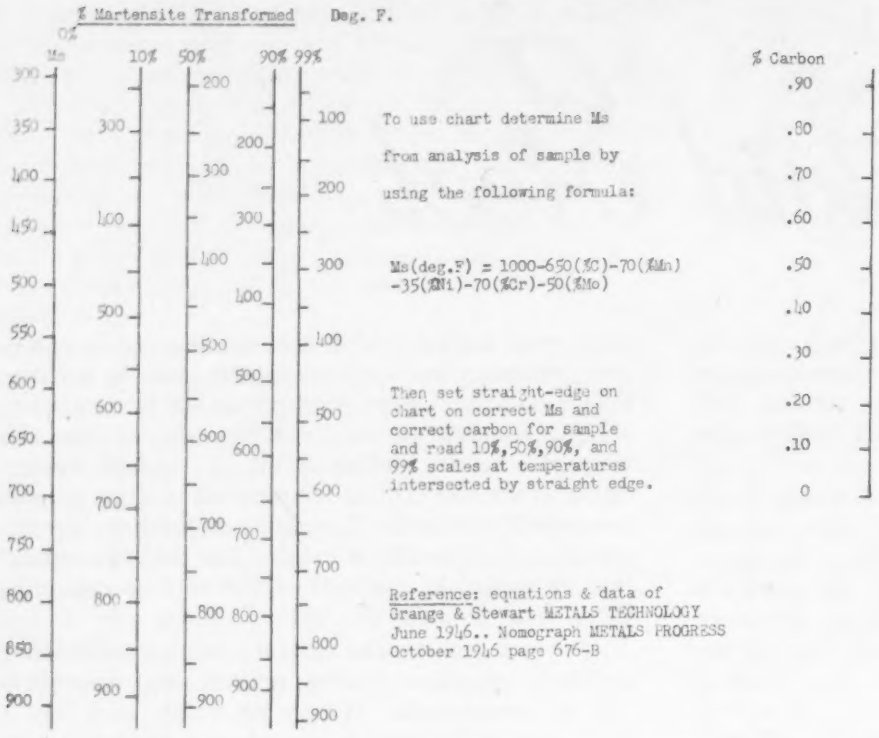
Ideal condition exists when the steel is brought to a temperature slightly above the Ms, allowed to reach temperature equilibrium throughout while remaining 100 per cent austenitic in the quench medium, then removed to a slower quench, usually air, where transformation to martensite may proceed evenly and comparatively slowly as the piece cools. Martensite produced in this manner is virtually stress free, and dilation gradients are minimized thus preventing distortion, quench cracking and microcracks in the martensite needles. With the foregoing conception of the mechanics of martempering in mind, let us more closely examine the specific requirements necessary for martemp[illegible] to be successful.

The larger a given piece to be treated the greater temperature gradients between the surface and center of the piece upon rapid cooling. We must arbitrarily establish some criteria of maximum temperature gradient in predicting the success of martempering. The author believes it reasonable to consider that if more than one third of the surface structure

Martempering 6 tons of alloy steel castings in molten salt

TABLE I

THE TEMPERATURE RANGE OF MARTENSITE FORMATION



has transformed to martensite while the center is at the Ms temperature the treatment fails in its intent.

Thus we may state successful martempering demands that when the center of the piece reaches the Ms, the surface shall be at a temperature no lower than that which will cause the formation of about 30 per cent or less of martensite. This we will call requirement 1. It is readily seen that when the quench bath employed is held at a constant temperature near the Ms of the steel being treated no undercooling can occur, and requirement 1 will always be satisfied.

The remaining requirements deal with the suppression of pearlite and bainite. Both are considered separately because their deleterious effects differ greatly in degree. Depending upon temperature of formation, pearlite is moderately to exceedingly soft by comparison with martensite. Any appreciable quantity of pearlite encountered in martempering renders a microstructure of low hardness and inferior physical properties. Therefore, requirement 2 is that very little or no pearlite shall be formed if martempering is to be successful.

Bainite and particularly lower or so-called accicular bainite more nearly approaches the nature and hardness of martensite than does pearlite. The harmful effects realized in a mixed microstructure of martensite and bainite (most pronounced in a lowering of the impact resistance) may be largely eliminated at the sacrifice of hardness by a draw treatment after martempering. Requirement 3, that only small amounts or no bainite be formed, cannot be considered as important as requirements 1 and 2, and must be given a wider latitude of deviation in achieving successful martempering.

Hardenability data are extremely useful in predicting the satisfaction of requirements 2 and 3 for a particular instance. The time-temperature-transformation (TTT) or "S" curve of the steel under consideration will give the reader a fair idea of what might be expected in the way of pearlite or bainite interference. The application directly of these curves is limited because they only indicate the time at which these structures form isothermally. Lorig and Manning[2] have shown that the relationship between transformation at constant temperature, and transformation during cooling is a complex matter which does not readily lend itself to rapid mathematical adaptation. Grossmann has established a fairly simple means of calculating from composition the ideal diameter round "Di" which will just harden throughout to 100 per cent martensite when water quenched from a known ASTM grain size. Using the Di in conjunction with heat flow equations it is possible to calculate the amount of time on cooling which must not be exceeded during martempering if products other than martensite are to be avoided. Hollomon and Jaffe[3] have further appended the work of Grossmann so that pearlitic Di and bainitic Di may be estimated separately, thus providing a key to the prediction of requirements 2 and 3.

Several methods are presently being employed to meet the three requirements of successful martempering. However, all the various procedures are essentially a ramification of two principles: The interrupted quench, and the high temperature quench. These two basic means will be considered and it will be shown how and when they should be used.

Obviously, the first thing to find when contemplating martempering is the Ms of the steel to be treated. This may be done by substituting the percentage of each alloying element and of carbon for the given steel in the equation shown in Table I. After finding the Ms, pearlitic and bainitic hardenabilities may also be calculated from composition according to the following equations of Hollomon and Jaffe:

(1) Pearlitic Hardenability: (for 100% martensite when water quenched from ASTM grain size No. 7)

$$Di(p)\ (\text{inches}) = .254 \sqrt{\%C} \times [1 + 4.10\ (\%Mn)] \times [1 + .64\ (\%Si)] \times [1 + .52\ (\%Ni)] \times [1 + .27\ (\%Cu)] \times [1 + 2.33\ (\%Cr)] \times [1 + 3.14\ (\%Mo)] \times [1 + 2.83\ (\%P)] \times [1 - .62\ (\%S)]$$

(2) Bainitic Hardenability: (for 100% martensite when water quenched from the hardening temp.)

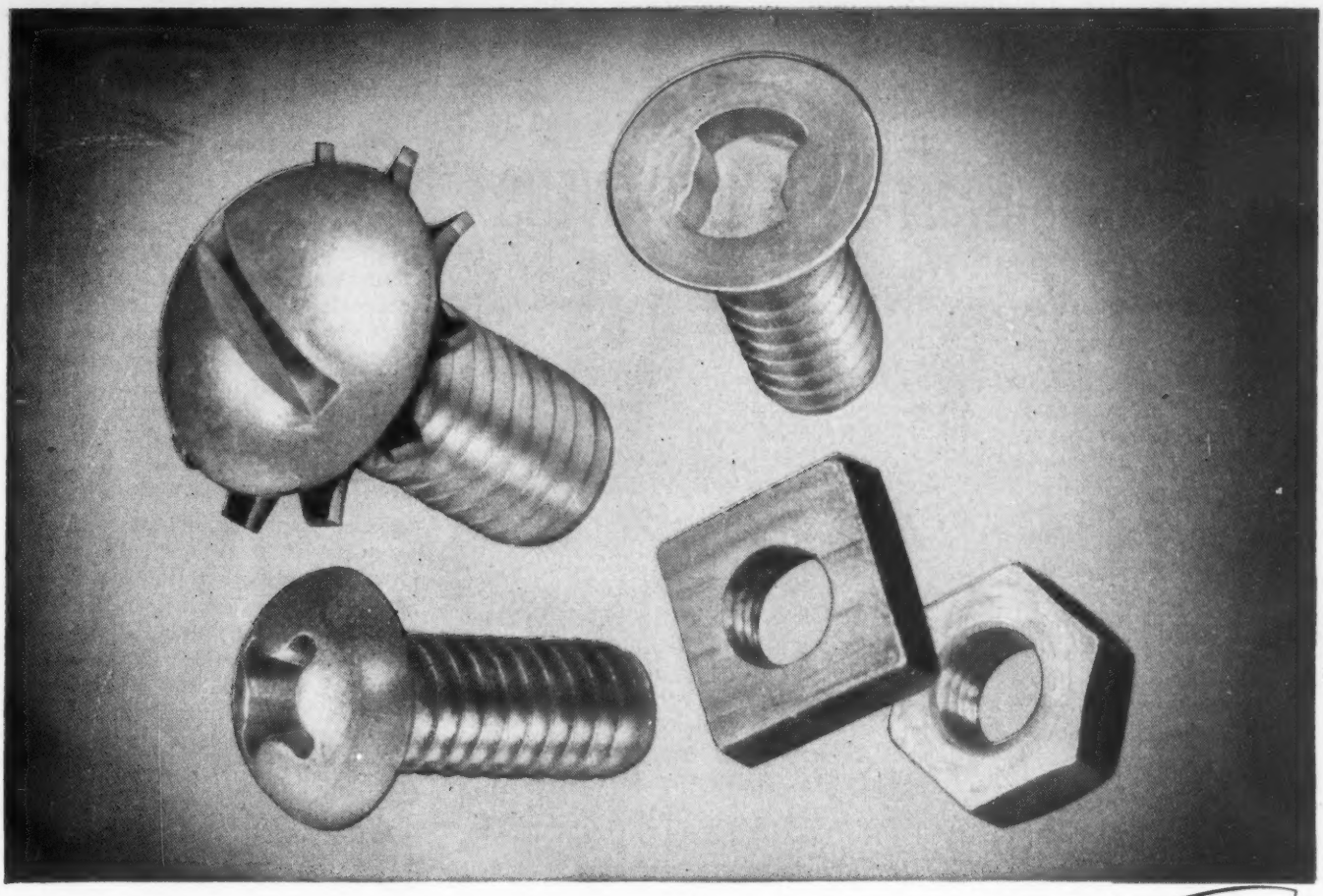
$$Di(b)\ (\text{inches}) = .272 \sqrt{\%C} \times [1 + 4.10\ (\%Mn)] \times [1 + .64\ (\%Si)] \times [1 + .52\ (\%Ni)] \times [1 + .27\ (\%Cu)] \times [1 + 1.16\ (\%Cr)]$$

Ideal diameters apply for any length.

It will be noted from equations 1 and 2 that the bainite transformation is influenced by alloy additions much as is the pearlite transformation except that molybdenum has no effect in suppressing the bainite "nose"; chromium has less effect in suppressing the bainite "nose" than the pearlite "nose"; and carbon has slightly more effect in suppressing the bainite "nose" than the pearlite "nose".

Equation 1 is adaptable for an ASTM grain size of No. 7 only. This represents the average grain size when hardening from a homogeneous

(*Please turn to Page* 121)



WHEN YOU CAN *COUNT ON EVERY* FASTENER... THAT'S t.f.e. True Fastener Economy!

It's the cost of using a fastener that counts

The saving you can make by being able to depend upon your supplier's "quality control" and by reducing inspection in your own plant, invariably amounts to a greater saving than could be effected if a lower price were available.

R B & W *Machine Screws and Stove Bolts Made to One Quality Standard*

At each RB&W plant, quality control is effective at every stage of manufacture—beginning with laboratory analysis of raw materials—*not* just at the end of the production line. The finished product that is delivered to you can be depended upon for uniformly high qualities—giving you a fastening device that assembles at high speed, provides maximum desired holding power and, in terms of finish, is a credit to the appearance of your assembled product.

You Get T. F. E. *When You*

1. Reduce assembly time to a minimum by savings through use of accurate and uniform fasteners
2. Make your men happier by giving them fasteners that make their work easier
3. Reduce need for thorough plant inspection, due to confidence in supplier's quality control
4. Reduce the number and size of fasteners by proper design
5. Purchase maximum holding power per dollar of initial cost, by specifying correct type and size of fasteners
6. Simplify inventories by standardizing on fewer types and sizes of fasteners
7. Save purchasing time by buying larger quantities from one supplier's complete line
8. Contribute to sales value of final product by using fasteners with a reputation for dependability and finish

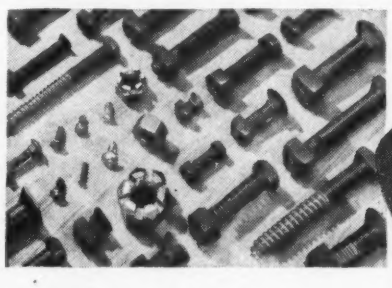
RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

102 years making strong the things that make America strong

RB&W bolts, nuts, screws, rivets and allied fastening products are manufactured in a broad range of styles, sizes and finishes.

• • •

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Portland, Seattle. Distributors from coast to coast. By ordering through your distributor, you can get prompt service from his stocks for your normal needs. Also—the industry's most complete, easiest-to-use catalog.



First Coke Pushed from

NEW LORAIN BY-PRODUCT OVENS

COKEMAKING capacity at the Lorain Works, National Tube Co. in Lorain, O., has been increased to a total of 1,650,000 net tons annually by the addition of new coke ovens with an annual capacity of 800,000 net tons. Improvements include enlargement and modernization of coal and coke handling facilities, the construction of three new coke oven batteries of 59 ovens each, numerous changes to facilities for recovery of coke chemicals and a coal and coke laboratory. New facilities represent the completion of an important step in the long range modernization and improvement program of National Tube Co.

Improvements in coal and coke handling facilities were made by

1. Installation of a rotary car dumper.
2. Doubling the number of mixing bins to increase coal mixing capacity from two to four types of coal.
3. Installation of gravimetric mixers to replace volumetric mixers for crushed coal.
4. Adoption of the use of conveyor belts in conjunction with the car dumper to replace the old stocking method which employed a shuttle car and pits thus improving stocking and reclaiming operations.
5. Concentration of a coke screening station designed to load coke into hopper cars or trucks.
6. Facilities for splitting coke braize into pea coke for commercial sale into coke dust for use in soaking pits and sintering plant.

New coke ovens consist of three batteries, each battery composed of 59 underjet-fired, low-differential, regenerative ovens of the Wilputte type. They are designed for firing with coke oven gas and may be underfired at some future time with blast furnace gas by the installation of suitable auxiliary equipment. The first coke was pushed out Oct. 9.

Recovery of coal chemicals has been improved by:

1. Installation of electrical precipitators for removal of tar from the coke oven gas.

2. Adoption of a process for production of ammonium sulphate that allows control over crystal size to replace old style saturators.

3. Installation of parallel control on exhausters.

4. Use of a continuous carbon disulphide column for the removal of this hydrocarbon compound from light oil.

5. Installation of a continuous benzol column to produce inhibited motor benzol replacing the batch still formerly used.

6. Use of a continuous residue removal column instead of a blow-over still.

7. Adoption of a distillation method for producing naphthalene.

The new coal and coke research laboratory that forms an important part of the program is devoted to research and development of new products and to determine the properties of coal used and coke produced in controlling operations. It features a 13 1/2-ton capacity coal testing oven for determination of expansion properties of coal.

Coal Handling and Storage System

The problem of increasing stocking devices, storage facilities and coal preparation and handling equipment was solved by the installation of a rotary car dumper which is capable of handling 30 cars per hour and is expected to handle 20 cars per hour under normal operating conditions, replacing unloading methods which formerly could handle only 65 cars in 8 hours. The number of available mixing bins has been increased so that the coal handling system can blend four types of coal instead of two as formerly. Gravimetric mixers were installed for the crushing of coal replacing volumetric mixers previously used.

High and low-volatile coals from mines that are owned by the United States Steel Corp. furnish the bulk of the coal for producing coke at Lorain Works. With the new coke ovens at normal operating rate, approximately 6300 tons of coal per day will be handled. Normally the coking coal mix is made up of equal amounts of high and low-volatile coals.

Space for storing coal and coke is provided between the concrete walls that carry the tracks on which the coal bridge operates. Maximum storage capacity, with all spaces filled, is 261,120 tons of coal, 27,000 tons of coke, 15,000 tons of coke braize and 5000 tons of steam coal. This storage capacity was provided by extending the former storage space a distance of 600 feet. Total length of the storage yard is now 1708 feet. Width between bridgewalls is 215 feet. Stock piles can attain a maximum height of 53 feet. Nominally, the space for storing coal is set up for separate storage of 125,000 tons of high-volatile coal and 100,000 tons of low-volatile coal, in addition to the quantities of coke, braize, and steam coal mentioned above.

Other improvements and expansion projects either completed or underway at Lorain plant, include the construction of an entire new bessemer steelmaking plant replacing the existing plant; installation of a new blooming mill, bar mill and billet mill to replace two existing blooming mills and a combination rail mill; a new continuous seamless tube mill; concentration of buttweld pipe making and pipe galvanizing facilities, and other major improvements including a new 3-acre pipe warehouse.

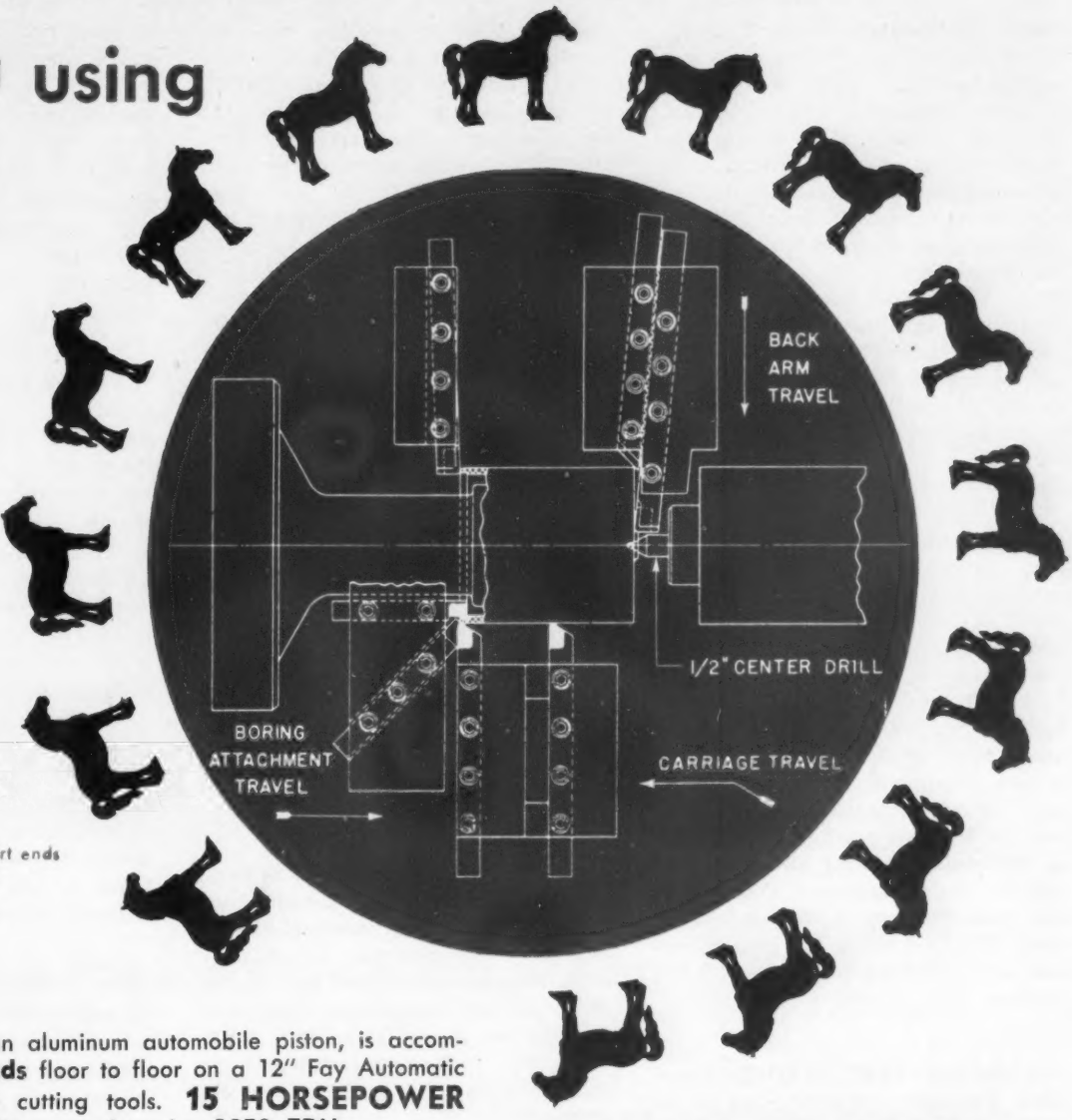
German Chromising Process Developments Published

Developments in the German "chromising" process for diffusing chromium from a volatile chromium compound into steel to improve the surface properties of metal products are described in a report prepared by British Intelligence Objectives Sub-Committee investigators and available from office of Technical Services, Department of Commerce, Washington.

The investigation, concerned only with war time developments and not those before the war, found that six German firms were using the process and all were making the same type of products, i.e., valves for controlling flow of various fluids, preheater tubes for destroyer engines, bolts chromized before threading and hose connectors. Valves were said to be especially resistant to corrosion. The chromized layer on the bolts was actually hardened by the threading operation, the report relates.

Aside from some experimental work, no new diffusing processes were found in Germany. Some unusual furnaces were examined and their features, along with sketches and diagrams are contained in the report, PB-52873, Report on Methods of Gaseous Metal Treatment.

How much HORSEPOWER are You using ?



1st. Operation on an Aluminum Automobile Piston:—
Rough turn O.D.
Face head and skirt ends
Center closed end
Rough bore skirt
Finish bore skirt
Chamfer skirt

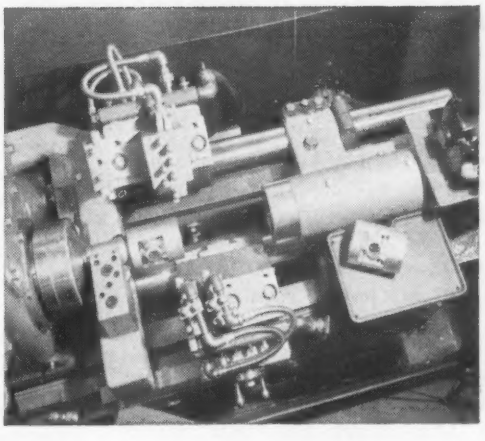
This operation, on an aluminum automobile piston, is accomplished **in 15 seconds** floor to floor on a 12" Fay Automatic Lathe using carbide cutting tools. **15 HORSEPOWER** is required. The surface speed used is **1250 FPM.**

Carbide cutting tools have increased horsepower requirements as much as 300 per cent. They have increased cutting speeds 200 to 500 per cent.

Be skeptical of the production efficiency of your metal turning equipment. The chances are that turning accounts for 25 per cent or more of all machining time in your plant—that this is your major production expense.

There are cases in our files of savings of hundreds of dollars a month in the manufacture of a single part by the efficient use of carbide cutting tools on Jones & Lamson machines Our Turret Lathes and Fay Automatic Lathes are designed specifically for the most efficient use of these tools.

Send for our folder "Machining Automotive Pistons". Or better yet, telephone or write for a Jones & Lamson engineer who will be glad to consult with you on all phases of your metal turning problems.



JONES & LAMSON MACHINE COMPANY, Springfield, Vermont, U. S. A.

Manufacturer of *Fay Automatic Lathes* and Universal Turret Lathes • Fay Automatic Lathes • Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical Comparators • Automatic Opening Threading Dies and Chasers • Ground Thread Flat Rolling Dies

Engineering News *at a Glance*

HIGH ABRASION RESISTANCE: Chromium plate on piston rings, according to a paper presented by H. O. Mathews, manager, fleet operations, Standard Brands Inc., before the West Coast meeting of SAE, acts in two ways to reduce wear. Chromium, being extremely hard itself is highly resistant to abrasion and, in the process of digesting abrasive material, reduces size and sharpness of the abrasive so that its cutting ability is lessened. Hard surface of chromium plate also has less tendency to pick up or become loaded with abrasive which contributes to reduced cylinder wear.

ELECTROSTATIC COAL CLEANING: During the war, the Germans operated a pilot plant in which they used an electrostatic process for cleaning coal at the rate 1½ tons per hour. According to the Office of Technical Services, Washington, the method was instrumental in reducing ash content to 1/10 to what it was before treatment. Principal advantage of electrostatic cleaning fine coal is that separation takes place in dry state, avoiding all wet working and sludge treatment. OTS points out that the low power and labor costs for operating the separators are also attractive features of the method.

NO "GRAPEVINE" NEEDED: Some 3000 employees, working on three shifts, in the plant of National Lock Co., Rockford, Ill., soon will disregard the "grapevine" system in learning "what's going on", so far as both employee and company activities, news and policies are concerned. All ten plant buildings, some of them six stories high, are being equipped with a comprehensive voice system. According to Communi-Sound Inc., Chicago, 225 speakers, using a total power requirement of 1500 watts, are being installed. Of particular value to National Lock is its ability to call and locate any person at a moment's notice anywhere throughout the vast plant area.

CAPSULE-SIZE TORNADO: In the latest jet power plant of the Phantom —latest aircraft engine produced by Westinghouse Electric Corp., South Philadelphia, Pa.—air rushes into the front of the engine at 300 miles per hour. It then whizzes through whirling blades of the compressor, which rams 50 tons of air into the combustion chamber every hour. Mixed with injected gasoline and ignited, the air produces a continuous tornado-like blast which spins the turbine blades 17,000 times per minute, then races 1200 miles per hour through the nozzle at the rear of the engine.

SURFACES CURVED STOCK: Round stock as well as bent tubing and slightly curved pieces are ground and surfaced by a centerless belt grinder exhibited by Porter-Cable Machine Co. at Hotel Sherman, during the Machine Tool Show in Chicago. The Syracuse company representatives explained that a soft resilient roll that follows the shape of the stock serves to eliminate danger of uneven pieces being out of round after grinding. The machine accommodates stock lengths from ¾-inch up, and diameters ranging from $\frac{3}{32}$ to 2¼-inches. It removes up to 0.005-inch ferrous material and 0.010-inch nonferrous material in one pass.

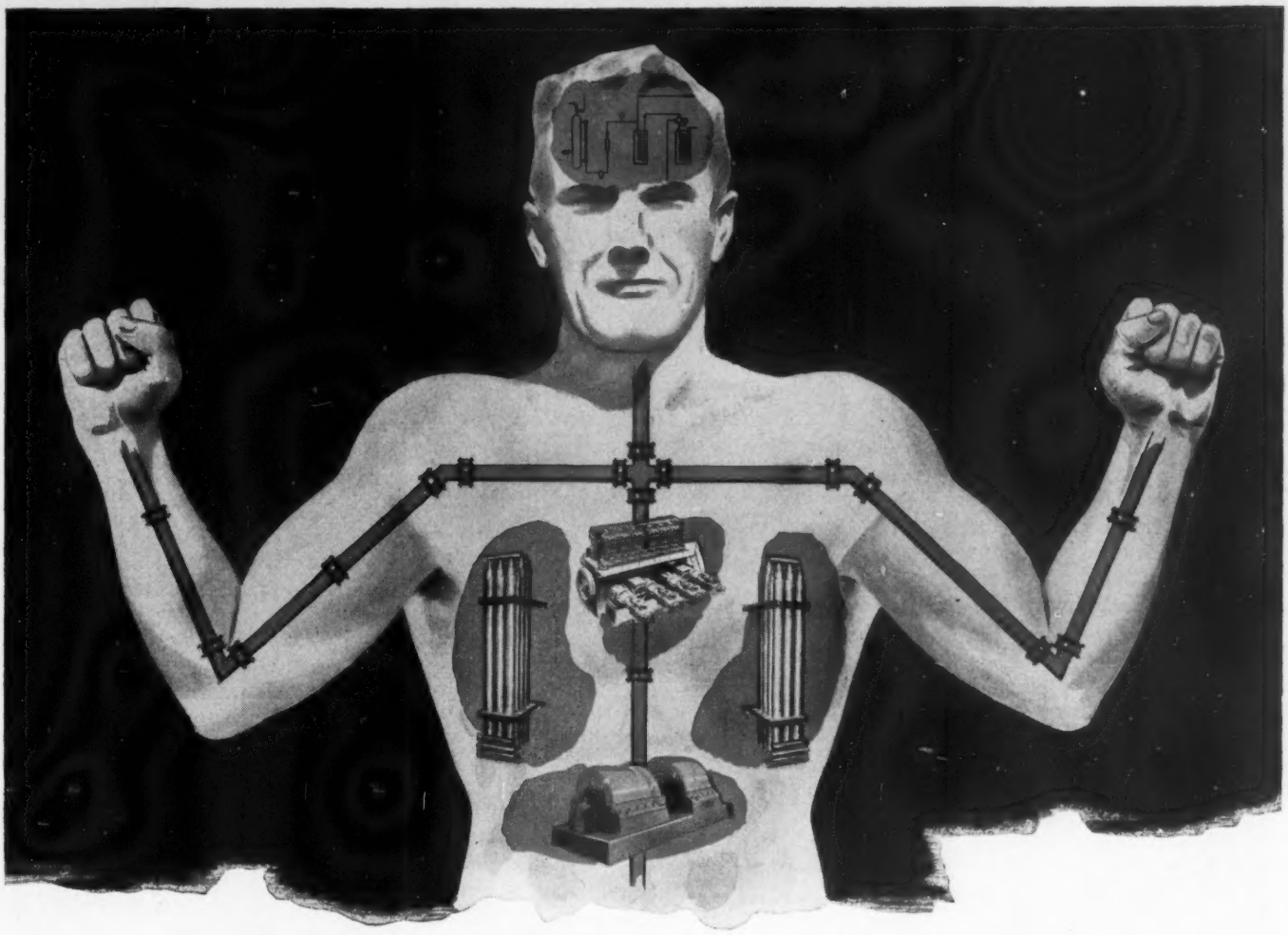
INEXPENSIVE HARD-FACING: Smooth, uniform, relatively thin hard coatings in a highly practical and inexpensive manner may be obtained with a new method for hard-facing developed by Metallizing Engineering Co. Inc., Long Island City, N. Y. The thin coatings are applied by using a metallizing gun and a "wire" composed of a powdered hard-facing alloy extruded with a plastic binder. The company reports that during the spraying operation, plastic binder is completely volatilized and the deposit consists entirely of the metallic constituent. Subsequent fusing with a torch results in a coating alloyed to the base, physically and chemically identical to hard-facings of the same alloy applied by other methods. Alloy used in the method is highly resistant to abrasion. It also has high strength at red heat and exceptional resistance to oxidation.

INSIDE STORY: In manufacturing Calrod units now used commonly in unit heaters, soldering irons and melting pots, the heaters begin life as straight-length metal tubes which vary according to the use the final heater is to be put. Into these tubes, General Electric Co., Schenectady, N. Y., reports, high-quality resistance nickel and chromium alloy wire is stretched and the tube filled with an insulation of powdered magnesium oxide which is finally packed to a rock-like hardness. The powders possess the peculiar property of affording high insulation, yet conducting heat with relatively high efficiency. Following the insulating operation, the heaters are then annealed and formed into various shapes required for application in many industrial machines and equipment.

WATCHMAKING DISCOVERY: In Elgin, Ill., it was learned, Elgin National Watch Co. terms its new mainspring alloy as "the greatest discovery in watchmaking materials" since the introduction of jeweled bearings in 1704. Made of cobalt, chromium, nickel, molybdenum, magnesium, iron, beryllium and carbon, the alloy is said to be 100 per cent rustless. It shows excellent resistance to all ordinary chemicals and is nonmagnetic. The alloy also is being spot welded—a procedure used by the company for the first time in joining the mainspring to a brace. For the operation, a Taylor-Winfield bench welder is used to weld a 0.0035-inch brace to the 0.0043-inch mainspring without resorting to annealing.

AIDS REFRIGERATION MAKERS: To meet heavy demand of refrigeration wholesalers and equipment manufacturers now absorbing the record output of its 1/4 and 1/3-horsepower models, Jack & Heintz Precision Industries Inc., Cleveland, is now "rolling off" its production line a new light duty ½-horsepower condensing unit. Made in two models, the unit is expected to simplify selection of sizes in borderline cases where an ordinary "third" might not provide sufficient capacity and a heavy duty "half" would be impractical from a cost standpoint.

HUGS THE GROUND: Tracks are not tied down, but oscillate freely to conform to ground contour as in normal tractor operation on the latest 2-yard bulldozer-shovel currently built by Frank G. Hough Co., Libertyville, Ill. In addition, a single lever enables the operator to raise, lower, hold or "float" the bucket, or apply down pressure when hard digging is encountered. An automatic tip-back which operates in connection with the bucket enables latter to be tilted back 38 degrees to avoid spillage of loads.



Breathing is merely the oldest use for OXYGEN

● Today, industrialists expect to turn coal into gasoline, to make city fuel gas more efficiently, to reduce tremendously the time required for making steel—with oxygen.

Now that it's cheap enough.

Up to now oxygen has cost about $75.00 a ton.* Dresser Industries is engineering and equipping plants to produce oxygen at $5.00 a ton. Even less for larger plants. That's 95% pure. Or 99.5% pure!

Through Stacey-Dresser Engineering, Dresser Industries lays out the brains, but through six other member companies Dresser builds, also, the actual bones and muscle that determine the payoff of your investment: the compressors, engines, air inter & aftercoolers, reversing exchangers, regenerators, expanders, reboilers, pumps, and the numerous less spectacular components. For years many of these have been standard products of Dresser members.

What would you like to know about high purity oxygen—fantastically cheap? Dresser Industries, Inc., Terminal Tower, Cleveland 13, Ohio.

**Ton O_2=24,000 cu. ft. standard conditions.*

Creative Engineering **FOR INDUSTRY**

with special emphasis on oil, gas and chemistry

DRESSER INDUSTRIES, INC.

BOVAIRD & SEYFANG Mfg. Co.
Bradford, Pa.

BRYANT Heater Company
Cleveland, O.; Tyler, Tex.

CLARK Bros. Co., Inc.
Olean, New York

DAY & NIGHT Mfg. Co.
Monrovia, Calif.

DRESSER Mfg. Division
Bradford, Pa.

DRESSER Mfg. Company, Limited
Toronto, Ont., Canada

INTERNATIONAL Derrick & Equipment Co.,
Columbus, Marietta & Delaware, Ohio;
Beaumont, Texas; Torrance, Calif.

KOBE, Inc.,
Huntington Park, Calif.

PACIFIC Pumps, Inc., Huntington Park, Calif.

PAYNE Furnace Co., Beverly Hills, Calif.

ROOTS-CONNERSVILLE Blower Corp.
Connersville, Ind.

SECURITY Engineering Co., Inc.
Whittier, Calif.

STACEY BROS. Gas Construction Company
Cincinnati, Ohio
Stacey-Dresser Engineering Division
Cleveland, Ohio

Blast Furnacemen Stress Importance of

SOUND HEARTH CONSTRUCTION

Operators give serious thought to bottom construction in view of over 20 hearth breakouts during the past two years. Important data on downcomer life, practice on carbon linings, roll scale treatment of hot metal and details of breakouts are presented at recent joint meeting of furnacemen in Cleveland

By JOHN D. KNOX
Steel Plant Editor, STEEL

IDEAL velocity of gas through blast furnace downcomer pipes is 28 feet per second; higher velocities usually result in failure of downcomers at or near bends in the system. This fact was brought out by C. M. Squarcy, blast furnace engineer, Inland Steel Co., East Chicago, Ind. at the joint meeting of the Blast Furnace & Coke Association of the Chicago District and the Eastern States Blast Furnace & Coke Oven Association, Carter Hotel, Cleveland, October 10. Wearing plates were recommended by the author at bends in downcomer pipes based upon Republic's practice at Cleveland. Sinter was thought to increase the failures of downcomers but study shows that this is not the case. The author pointed out that the life of auxiliary gas mains depends upon the efficiency of the dust catcher itself. Decreased downcomer area, he explained, lowers the velocity of the gas and decreases downcomer failures.

Discussion of Mr. Squarcy's paper brought out the following: While large downcomer pipes offer a means of reducing the velocity of the gas yet they may be expensive. Unlined pipes are less expensive; when a brick lining is installed, however, either cast iron or white iron plates should be installed at the elbows. Soft and hard burned brick make a vast difference in the life of downcomers. One operator reported that a reduction in the out velocity of the gas washer is effective.

At an Ohio furnace where the downcomer is lined with 4½ inches of brick and gas velocity ranged from 30 to 35 feet per second, failure occurred at a point where the downtake comes off of the uptake pipe even before the first campaign was completed. Importance was attached to the radius of the bend of downcomers and then velocity. At one furnace cast iron plates substituted for brick where wear was excessive lasted 16 years. It was brought out that downcomer failure is not refractory problem inasmuch as suitable brick can be selected for such severe service.

In presenting a progress report on carbon bottoms for blast furnaces, C. J. Fleisch, superintendent, Carrie Furnaces, Carnegie-Illinois Steel Corp., Rankin, Pa. pointed out that the size of the cast with carbon hearths is more uniform but where the hearth is cold, it requires more coke to restore the temperature at that point. No change has been noted in flushing or tapping practice. Temperature of the iron taken with an optical pyrometer shows no difference over metal cast from fire clay hearths. Following a recent 10-day shutdown of two fireclay furnaces, it was found that it required more time to obtain iron suitable for the open hearth from these bottoms than was true of the carbon hearth furnaces. Practice also shows that it takes twice as long to get a satisfactory flush of slag from fireclay hearths as with furnaces having carbon hearths.

At an Eastern plant where two furnaces are equipped with carbon hearths practice shows that the furnaces cast better and that a 6½ to 7-foot hole is maintained. On one of these hearths where a thermocouple is installed, it was found that it required three weeks for the furnace to reach a peak temperature of 1360 degrees. Later this temperature leveled off to 750 degrees which it has held ever since. An Ohio operator mentioned that since the installation of a carbon hearth, he has noticed an absence of coke messes.

At an Ohio valley stack with a hearth of 25½ feet and in operation on a carbon hearth since last April, practice discloses that the furnace flushes all the cinder and maintains a taphole from 5 to 6 feet. It has been found that the temperature of the iron on test is approximately the same as with conventional hearth practice. The swings of silicon is found to be greater; in fact, the furnace can be swung back quicker than the conventional furnace.

No reduction in the amount of water used on carbon hearths for cooling purposes has been noticed, nor has any trouble been encountered with shrinkage at the carbon and ceramic joint when the stack has been blown in after a bank. Based upon the observation of two blast furnacemen, there is no increase loss of monkeys or monkey coolers with carbon hearth furnaces compared with fireclay hearths.

Uniform casts are obtained with carbon hearths at a stack in the Chicago District. Cooling water temperatures are far better than on other furnaces in the group. Tests indicate that there is less heat lost with the carbon hearths than with the ceramic hearths, though it was pointed out that no carbon ring wall is installed.

At an Ohio valley furnace, the hearth bottom blocks are laid on sillimanite which assures a tight job. With this construction, the furnace men pointed out that when the stack is blown in from bank, or after a relining, there are no gas leaks around the bosh. Two years ago, a thermocouple was installed in the bottom of the hearth after six courses of 18-in. bottom blocks were put down. Records disclose that it required one year to get the hearth at the location of the couple up to a temperature of 1000° F.

Desiliconizing Hot Metal with Roll Scale by J. H. Frecka, assistant superintendent blast furnaces, Portsmouth Steel Corp., Portsmouth, O.: Early in 1939, the Wheeling Steel Corp. began experiments at their

Save machining time, produce accurate parts

With J&L Precision Ground Cold Finished Steel

The size accuracy and surface finish of J&L Precision Ground Cold Finished Steel is used to advantage by many manufacturers in machining parts. They find it eliminates part of the machining operation, saves tool wear and tool changes. J&L Precision Ground is available in a wide range of grades in sizes ¼" and larger from mill or your nearest J&L warehouse or distributor.

JONES & LAUGHLIN STEEL CORPORATION

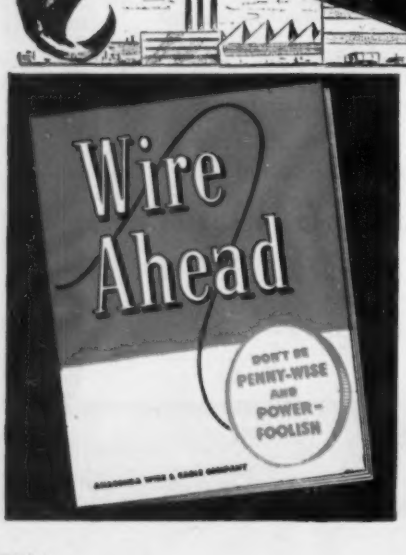
PITTSBURGH 30, PA.

Arrest this Thief!

INADEQUATE WIRING, the industrial jinx, can rob any plant large or small . . . of as much as 25 to 50 percent of rated efficiency. And what's most discouraging, the greater the production load, the deeper he digs into your resources.

Obsolete, overextended, overtaxed wiring may be difficult to detect, but it's too expensive to ignore. You may not be able to see this demon, but your plant power engineer, your consulting engineer, electrical contractor, or utility power salesman *can*. A little policing now may save expensive alterations later.*

47440



*WIRE AHEAD, a new booklet discussing preventive maintenance . . . the symptoms of inadequate wiring . . . and presenting plans for anticipating electrical demand, is now available on request. Address Advertising Department, 25 Broadway, New York 4, N.Y.

ANACONDA
from mine to consumer

ANACONDA WIRE AND CABLE COMPANY

Portsmouth furnace with the reduction of silicon in the hot metal through the use of roll scale. This reduction was desirable to enable the open hearth to use a higher percentage of hot metal per heat, which in turn would permit the blast furnace to operate at a higher rate of production.

Roll scale was, at the beginning of these experiments, shoveled into the iron runner leading to the ladles. After several months of experimentation with varying amounts of roll scale, the following method was developed:

A steel hopper, large enough to hold 10,000 pounds roll scale, equipped with a valve operated by cables and a vibrator was erected over the opening of the 75 ton Pollack iron ladle, so that scale could be fed directly into the ladle at the same point where the stream of metal was pouring into the ladle.

A mixture of 6800 to 7500 pounds roll scale, plus 300 pounds soda ash briquettes, depending on the expected pig iron analysis, was placed in this hopper. After approximately 8 to 12 inches hot metal had been run into the ladle, the valve was opened, allowing the scale to drop into the ladle—the speed of the reaction being controlled to some extent by the amount of valve opening.

The purpose of the soda ash was to increase the fluidity of the slag produced in the ladle. The reaction in the ladle was violent with a tendency of the slag to foam up over the top of the ladle. During this brief period of foaming, 100 to 200 pounds salt was thrown into the ladle in 25-pound bags. This stopped foaming better than any other material we tried. After the foaming had subsided, the ladle could be filled to the normal level without any further action.

At the completion of the cast, the ladles were taken to the pig machine immediately and the slag poured off the top of the metal over the pig chain thus forming pigs or chunks of slag of a suitable size to be recharged into the furnace. This recharging of the roll scale slag, as we called it, was necessary to recover the manganese taken from the pig iron by the roll scale reaction, as well as the recovery of the iron due to incomplete reduction of the roll scale.

The following statistics represent an average of ten months operation from Jan. 1 to Nov. 1, 1940:

Roll scale/ton hot metal, lb	100
Soda ash/ton hot metal, lbs	5.2
Salt/ton hot metal, lbs	2.9
Roll scale slag produced/ton hot metal lbs	49
Metallics in roll scale/ton hot metal, lbs	68
Metallics to roll scale slag, %	28.67
Metallics replacing silicon, %	14.26
Metallics as increased pig iron, %	57.06

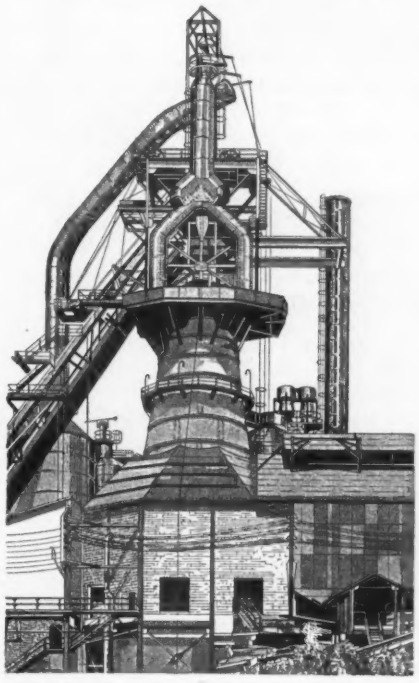
Average analysis of pig iron before and after treatment with scale:

Element	Before	After
Silicon, %	0.97	0.55
Sulphur	0.035	0.035
Manganese	1.75	1.18

Analysis of roll scale slag:

Element	Per Cent
SiO_2	38.44
Al_2O_3	2.23
CaO	7.70
MgO	1.51
Fe	19.19
Mn	17.65

Lime and magnesia in the slag was increased by the necessity of adding burnt lime after pouring off the slag at the pig machine to avoid



excessive action on the ladle lining. Temperature of hot metal in the ladle was approximately 150 degrees Fahr higher than normal. Use of this desiliconized hot metal at the open hearths decreased the time of heats from 20 to 30 minutes. This practice was discontinued in 1940 because sufficient open hearths were operating to take all pig iron production at normal analysis.

At a round table discussion at the afternoon session on hearth breakouts, it was stated that over 20 breakouts had occurred at blast furnaces in this country over the last two years. These were attributed either to operating conditions such as taphole stops, insufficient cooling hearth segments or poor quality fire brick.

An operator of a Lake furnace had the following to say concerning a breakout at his plant: The stack had 700,000 tons in the campaign when the side opposite the taphole and the brick above hearth jacket as well as another section of brick blew loose. Water was shut off to a section of plates, the union broken and iron came up through the floor. After the furnace was flushed, the wind was pulled low and the furnace cast. Meanwhile 40 tons of iron had been put on the ground back of the furnace. After digging down, we found a hole 2 feet in diameter through the jacket. Plastic was put in the hole following by brick and concrete and then four tuyeres were blanked and the wind put on the furnace again. At the end of two casts, the furnace was blown out. At the breakout area only 1 inch brick work was found at the elevation where the hearth comes into the hearth block. A salamander of 294 tons was drained and a new hearth installed. After a month or so of operation on the new hearth, a breakout occurred above the tap hole. After digging out an area 3 feet wide to secure proper anchorage for a patch, we found approximately 5 inches of brick work. A patch was installed and the furnace again placed in operation.

Another operator reported three breakouts during the last four years at his plant. He emphasized that modern mud gun technique makes a difference in the length of hole. He also stressed the importance of getting a good graphite coating on the brick walls and cautioned that stopping the furnace while on wind continually does not allow sufficient coke to get down into the hearth to coat the brick work. His practice, however, is to check the furnace and allow a sufficient amount of the stack column to settle and thus get coke into the hearth.

Mobile Transformer Unit Gives Power Flexibility

Mounted on a flat-bed carry-all type trailer, a mobile single phase transformer unit rated at 60 cycles, 10,000 kilovolt amperes, 132,000/19,-950 volts has released fixed standby transformer units for other duties and has added flexibility to the four major transmission substations of Indianapolis Power & Light Co., Indianapolis, Ind. Core and coils are installed in a horizontal position to cut down the overall height. Equipment is forced-oil cooled.

High voltage parts have sufficient clearance from the ground to prevent accidental contact, GE states, and all moving elements are encased in metal shielding. Power for the auxiliaries is supplied by a control power transformer also mounted on the trailer.

Importance of Standardizing

Specifications for Engineering Materials

By BENJAMIN MELNITSKY

INDUSTRY would be at a loss without scientifically devised standards for engineering materials. Industrial standards embodied in specifications for engineering materials have many shortcomings, which limit their usefulness and restrict their use. Some of these shortcomings are:

(1) There is no single agency to unify and co-ordinate specifications; (2) specifications overlap one another in function, intent, and purpose; (3) there is too much duplication; (4) too many government and private agencies sponsor specifications; (5) specifications become out-dated rapidly . . . amendments, revisions, and changes are made frequently in some cases; whereas in other cases, specifications are not kept up-to-date; (6) specifications are not given the proper attention in some plants; in other plants too much emphasis is placed on them.

If plants using specifications have a constructive awareness of the shortcomings, these limiting factors can be by-passed and maximum benefits derived from specifications for all types of engineering materials. Some of these benefits are outlined in the paragraphs that follow.

Purpose of Specifications

Specifications serve as a shorthand means of transmitting definite, concise, and complete statements of information about properties and characteristics desired in materials. The combination of letters and numbers of a material specification is an abbreviated representation of a tremendous amount of information. For example, the simple numerical-alphabetical symbol A 4145 specification number for chrome-moly steel indicates the following facts: (1) Method of manufacture, (2) manufacturing practices, (3) manufacturing tolerances, (4) exact chemical composition limits for all components of the steel, (5) methods of sampling and analyzing the metal, (6) permissable variations in dimension, weight, and workmanship, (7) means of marking, packaging, and loading. If this information had to be written out each time a new order for material is placed with a vendor, each purchase order would be a small volume in itself.

The numerical-alphabetical symbols of specifications have unilateral meanings; there is no possibility of more than one interpretation. For instance, A 4145 steel, cited above, means one distinct type of steel to manufacturers, processors, and users.

Specifications serve the same function in ordering and fabricating of engineering materials as does the principle of interchangeable parts in assembling and replacing component parts. Interchangeability means that one part can be replaced by another part that is identical in all physical dimensions. Specifications mean that duplicate parts can be fabricated so that they will have the identical physical and chemical properties of the original.

Makes Fabrication Simpler

Specifications standardize materials used to fabricate parts; and, in turn, simplify fabrication. An automatic screw machine or automatic lathe can operate continuously—without changing the feeds, speeds, or machine settings—using metals produced in different mills of different heats and purchased from different vendors. This is possible if all the bars that are fed into the machine are made under the same specification number. If specifications were not used, each batch of metal would present a distinctly new fabricating problem.

Purchasing is simplified and made more economical because of specifications. Materials can be procured quickly in the open market under the most favorable conditions. Purchasing agents need not rely for materials on one source of supply. The shorthand factor of specifications eliminates the need for elaborate instruction and at the same time insures that all materials will be received as ordered.

The underlying value of specifications is that they co-ordinate and set aside solved problems, leaving the way open to the solution of new problems. Thus, energy is directed to those phases of engineering materials that need active consideration.

Before full benefits can be derived from specifications, thought must be given to the means of by-passing some of the shortcomings of present day specifications. The greatest difficulty lies in the complexity of the subject.

The National Directory of Commodity Specifications issued by the National Bureau of Standards, Department of Commerce, contains over 1300 standard catalog-size pages and lists more than 35,000 specifications. The task of using specifications is further complicated because for each type of engineering material there are in effect many individual specifications.

As time goes on, these specifications will be simplified and many will be eliminated. However, until simplicity instead of complexity rules the question of specifications, each user of engineering materials must know the inter-relationship of various types of material specifications.

This information can be had for certain types of materials from vendors and distributors of these materials. Usually the inter-relationship is shown on charts. Additional information on this subject can be obtained from trade associations and government bureaus.

Another complicating factor is that many materials are sold under a manufacturer's trade name or brand name rather than under specification numbers. An example of this is chromium-nickel stainless steel designated by A. I. S. I, type No. 301. This one type of steel is sold under many trade names. The relationship between vendor's brand or trade names and specification numbers should be known. This information can be obtained from vendors.

Keep Information Up-to-Date

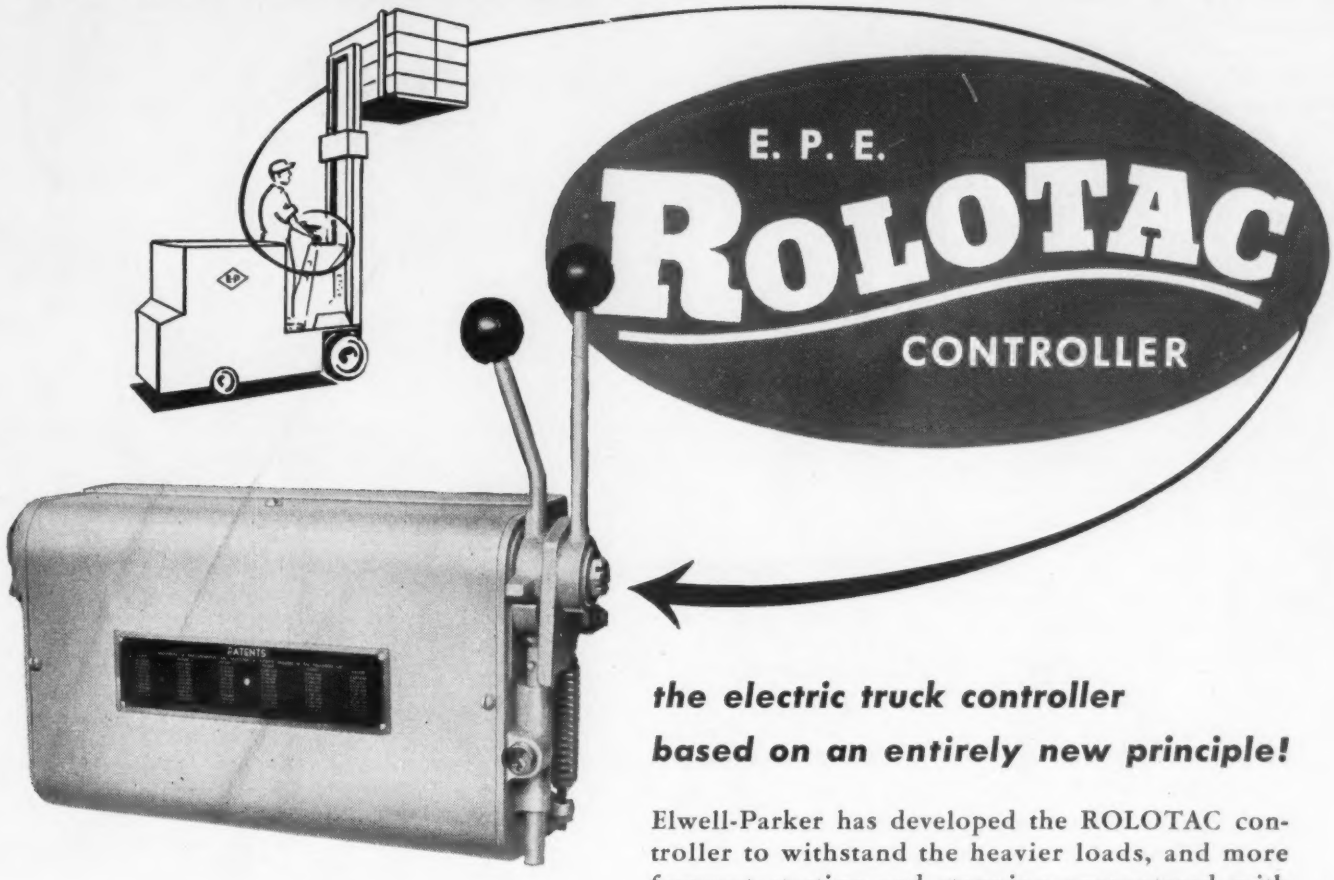
Specifications are frequently revised, amended, and superceded. These changes must be known and provisions made to keep all specifications up to date. Many plants still stick to old, out-dated specifications. For instance many plants carry steel under the old 1941 numbers despite the fact that many of the old 1941 numbers have been changed and replaced with the new combined specifications.

Many plants do not take advantage of the values that can be derived from specifications for engineering materials. Some plants disregard available specifications for materials and order metals and other products on the basis of their own special formulas. The reasoning is that products can be made best from special tailor-made materials which are designed to produce certain, definite results. Such reasoning is sound in many cases just as it is unsound in many others.

Quite often special requirements

(*Please turn to Page* 127)

Elwell-Parker leads again with



the electric truck controller based on an entirely new principle!

Elwell-Parker has developed the ROLOTAC controller to withstand the heavier loads, and more frequent starting and stopping encountered with modern trucks. ROLOTAC embodies a new principle for super-speed—the trigger snap and rocking action assure an instant make and break at the tips and not on the contact working surface. The breaking of heavier currents is handled by magnetic blowout. ROLOTAC has larger contacts and greater current capacity. It conserves power, requires less service, and assures continuous handling of larger loads in less time. ROLOTAC includes all well-known E-P safety features, such as the "dead-man" control. It is a worthy companion of the E-P built, Class B Motor—both can take all the power the recommended batteries will furnish.

The most gruelling tests prove ROLOTAC is an extra-husky controller. It has seen two and one-half years actual operation, among others, in one forge shop for over 20 hours per day with over 7,000,000 make and break operations.

Have your E-P man give you full details on this newest superiority of Elwell-Parker Trucks. The Elwell-Parker Electric Co., 4501 St. Clair Ave., Cleveland 14, Ohio.

10 SUPERIORITIES OF ROLOTAC

1. Super-swift snap action.
2. Arc blowout feature.
3. Tamper proof, locked mechanism.
4. Shock proof construction.
5. Interchangeability of fingers and contacts.
6. Extra large contacts.
7. Positive, efficient transfer of current.
8. Accommodation of no plug feature.
9. Four speeds in both directions.
10. No adjustments required.

ELWELL-PARKER
POWER INDUSTRIAL TRUCKS
Established 1893

Stability of Steel

(*Continued from Page 89*)

peratures on the impact transition embrittlement range. Certain steels will be selected for this test and after exposure at temperatures of 900, 1050 and 1200° F for various time periods up to 100,000 hours, standard Charpy keyhold notch impact tests will be made. A range of impact test temperatures will be selected in order to establish the transition zone for each steel. Information of this type will contribute much to a better understanding of the impact test temperatures will be posure to elevated temperatures.

All 1 x 1 x 20-inch surface ground test bars were weighed and calipered prior to placement in the furnaces. After completion of a given time cycle, the scale was removed from the bars and they were again accurately weighed and calipered to determine loss in metal due to scaling. Scale was removed from the 1000-hour samples with rodine inhibited sulphuric acid, but plans are now made to descale by the sodium hydride process those samples that will be removed from the furnaces at the end of 10,000 and 100,000 hours. It is too early to report significant trends in the data.

Creep and Creep-Rupture Tests: One of the primary objects of the program is to determine the high temperature creep characteristics of the steel being exposed. Graphitization is important only insofar as it affects the performance of these steels in service. In the heat-affected zone of a weld, graphitization may develop a structural condition which reduces the strength and ductility of the material. This condition will be evaluated in the microstructure after exposure and will not be a part of the creep studies.

Influence of structure resulting from long periods of exposure at elevated temperatures on the creep characteristics of material which has not been welded will be determined. In this investigation, creep-rupture properties will, in general, be determined instead of the usual creep properties. In plate materials and parts of steam generating equipment, such as turbines, the importance of the usual creep properties is recognized. However, for tubular products, creep-rupture properties are considered to be of fundamental importance.

Creep-rupture properties will be determined upon the basis of approximately 1000-hour tests. This is an important consideration because it would be physically impossible to evaluate the creep characteristics of the large number of specimens in this program if 3000-hour tests were employed. Experience indicates that for most steels the slope of the stress-time to rupture curve is reasonably constant after 1000 hours of testing and, therefore, should be considered a satisfactory evaluation test for the material.

National Tube Co. is now equipping a modern creep and creep-rupture testing laboratory to carry out creep-rupture tests on samples from exposed 1 x 1 x 20-inch bars, Fig. 3. This equipment will include 18 combination creep and creep-rupture machines of the lever arm type. Creep measurements will be made with mechanical extensometers and automatically recorded. In addition to the 18 individual creep units, two screw-driven short-time high-temperature testing machines will be available.

The screw-driven machines equipped with automatic stress-strain recorders will be used for tensile and short-time creep-rupture tests, and may be operated at temperatures exceeding 2000° F. A minimum of five specimens will be used in the creep-ruture tests. Unexposed bars and a complete set of exposed bars for each grade will be creep-rupture tested at 900, 1050 and 1200° F.

U. S. Steel Corp. research laboratory has under way a 1000-hour creep-rupture testing program involving many of the unexposed steels used in the National Tube Co. program. Other heats of steel representing these same grades have already been evaluated in creep with a 3000-hour test.

Austenite Grain Size: After the discovery of graphitization in steam power plant piping it was soon observed that the austenite grain size, as determined by carburizing steels at 1700° F for 8 hours, was related to the susceptibility of steel to graphitization. In this test, grain size of the carburized case is determined with a metallurgical microscope at 100 magnification and the structure is rated in accordance with the standard ASTM grain size chart. A grain size rating of 1 to 5 is considered coarse; and 5 to 8 is fine.

Results of various investigators indicate that certain coarse grain steels are less susceptible to graphitization. The steel maker in melting a coarse grain steel may require a small amount of aluminum for proper deoxidation, otherwise he must depend entirely upon the use of silicon in the production of steel for sound seamless pipe.

In addition to austenite grain size, the structural condition after carburizing and furnace cooling with respect to the amount of free ferrite present in the carburized case has also been claimed, in certain instances, to be related to graphitization. This structural condition has been described as "normal" (no free ferrite) and "abnormal" (varying amounts of free ferrite). It has been shown in several types of steel that an abnormal structure after carburizing is an indication of greater susceptibility to graphitization.

It has also been observed that abnormal steels of the type under consideration usually have a fine austenite grain size. Normality is a property of steel which is not only related to the steelmaking practice, but is also influenced by the cooling rate after carburizing. It has been demonstrated that other methods of a more precise and practical nature offer possibilities for controlling the graphitization of steel.

In this investigation, austenite grain size of steel was evaluated in accordance with the standard ASTM method. In order to obtain information regarding normality, the carburized specimens were examined at 1000 magnification, and the amount

STEEL GRADES UNDER INVESTIGATION

Carbon Steels

Low C Openhearth Cap
Low C Bessemer Cap
Deoxidized Openhearth
Deoxidized Bessemer

Low Alloy Steels

AISI 1118	AISI 4337
1137	4615
2320	4640
2517	4815
3115	6120
3130	6145
3316	NE 8624
4115	NE 8630
4140	Low C (Ni-Cu-Ti)
4317	Low C (Zr)

Molybdenum and Chromium-Molybdenum Steels

0.50% Mo
0.50% Mo (Zr)
0.50% Mo (Ti)
0.50% Mo (Cb)
0.50% Mo (Low C Ni, Ti)
0.70% Mo (Low C Ni, Ti)
1.00% Mo
1.00% Mo (Ti)
1.00% Mo (Cb)
1.50% Mo (V)
0.25% Cr—0.50% Mo
0.25% Cr—0.50% Mo (P)
0.25% Cr—0.50% Mo (Ti)
0.50% Cr—0.50% Mo
0.50% Cr—0.50% Mo (P)
0.50% Cr—1.00% Mo
0.50% Cr—1.00% Mo (P, Ti)
1.00% Cr—0.50% Mo
2.00% Cr—0.50% Mo
3.00% Cr—1.00% Mo
5.00% Cr—0.50% Mo
5.00% Cr—0.50% Mo (Si, Ti)
5.00% Cr—0.50% Mo (Ti)
5.00% Cr—0.50% Mo (Cb)
9.00% Cr—1.00% Mo

Ferritic Stainless Steel

USS 12 (410)
USS 12 Al (405)
USS 12 Mo (410)
USS 12 FM (416)
USS 17 (430)
USS 27 (446)

Austenitic Stainless Steel

USS 18-8 (304)
USS 18-8 (Ti) (321)
USS 18-8 (Cb) (347)
USS 18-8 (Mo) (316)
USS 18-8 (FM) (303)
USS 18-8 (Al-Ti) (322)

Apply the advantages of WESTINGHOUSE SPEED REDUCERS

... to your drive applications

When you select a unit to reduce prime mover speed, be sure to get the plus features offered in Westinghouse Speed Reducers.

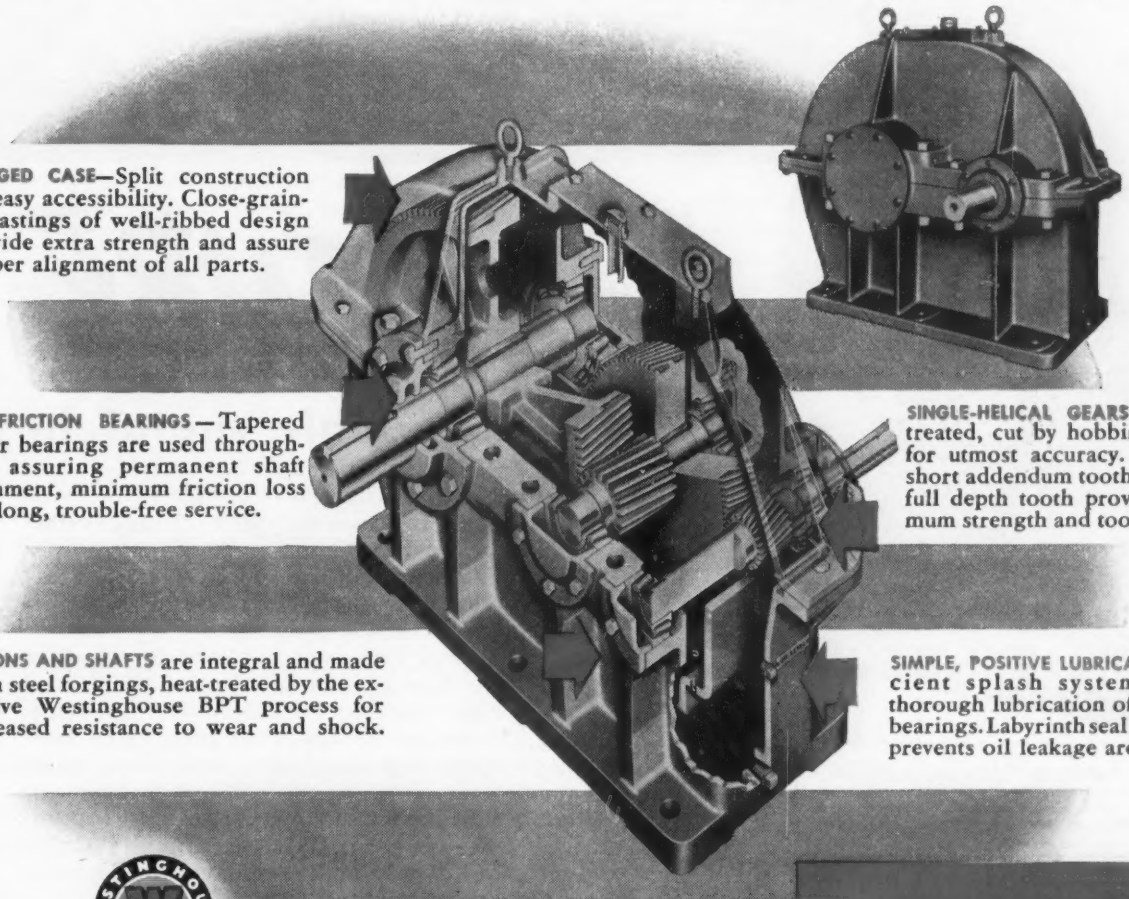
High operating efficiency and long service life are assured by Westinghouse design, precision manufacturing methods and selection of materials used in construction.

Exact speed reduction requirements may usually be obtained from the 24 standard sizes, for drives up to 500 hp, with choice of 28 ratios from 2.82 to 70.5.

Get in touch with your nearest Westinghouse office for assistance on the application of Westinghouse Speed Reducers to your own drives. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-07260

★ ★ ★

Type SH speed reducer—a single-reduction unit furnished in 13 standard ratios in each of 12 sizes. Type DH speed reducer (cutaway view, below) is a double-reduction unit, offered in 15 standard ratios in each of 12 sizes. Power transmission efficiency of Type SH averages 98%. Type DH averages 96%.



RUGGED CASE—Split construction for easy accessibility. Close-grained castings of well-ribbed design provide extra strength and assure proper alignment of all parts.

ANTIFRICTION BEARINGS—Tapered roller bearings are used throughout, assuring permanent shaft alignment, minimum friction loss and long, trouble-free service.

SINGLE-HELICAL GEARS are heat-treated, cut by hobbing process for utmost accuracy. Long and short addendum tooth form with full depth tooth provides maximum strength and tooth overlap.

PINIONS AND SHAFTS are integral and made from steel forgings, heat-treated by the exclusive Westinghouse BPT process for increased resistance to wear and shock.

SIMPLE, POSITIVE LUBRICATION—Efficient splash system assures thorough lubrication of gears and bearings. Labyrinth seal in end caps prevents oil leakage around shaft.

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

4 OUT OF 5 DRIVES need speed reduction

Westinghouse Industrial Geared Drives are fully described and illustrated in Booklet B-3730. Write for your copy.

it's all

REX-TUBE

Flexible metal hose!

Three photos can show only the beginning of uses for Rex-Tube Flexible Metal Hose. And there's a good reason for this wide range utility . . . Standard Rex-Tube is made in *24 different types* of galvanized and stainless steel, brass, aluminum, and other alloys . . . in sizes from 5/32" to 12" inside diameters!

Each Rex-Tube type has been developed to handle certain applications best. CMH leadership in the science of FLEXONICS* provides the knowledge necessary to make Rex-Tube dependable and long-lasting in service, where temperature, pressure, vibration or corrosion conditions are unusually severe.

Write today for CMH Catalog G-47 . . . It gives full details on Rex-Tube — and on other CMH quality products.

*the science of FLEXONICS . . . "the controlled bending of thin metals for use under varying conditions of temperature, pressure, vibration and corrosion" . . . is exemplified in the basic products of Chicago Metal Hose Corporation.

"FLEXON" *identifies CMH products, which have served industry for more than 45 years.*

CMH

CHICAGO METAL HOSE CORPORATION

Maywood, Illinois • Plants: Maywood and Elgin, Illinois

of free ferrite present was rated as normal (I), slightly abnormal (II), moderately abnormal (III), and extremely abnormal (IV). A chart illustrating the various classifications for normality will not be developed as sufficient information for those interested in this aspect of the problem may be obtained from the classification proposed.

The primary object in examining the exposed samples illustrated in Figs. 3 and 4 under the metallurgical microscope is for evaluation of graphitization. The program was not long under way when the need was realized for a standardized method of evaluating graphite. It can be appreciated that a photographic record of all samples would be impractical and also difficult to summarize and report. Therefore, one of the first considerations of this program was the development of a standardized method for evaluating graphite.

After several methods were tried, the chart shown in Figs. 1A and 1B was developed. This chart, currently being used, is based on the size of graphite particles. The number and type of particles are not shown on the chart, but these variables are introduced in the graphite rating employed. Size progression shown in A, B, C, etc. is a logarithmic progression proportional to the volume of the individual nodule size shown. For example, B represents a nodule size of $\sqrt{10}$ x the volume of A nodule. C represents a nodule size of $\sqrt{10}$ x the volume of a B nodule or 10 x the volume of A nodule, etc.

In evaluating microstructure, the entire sample is surveyed and if graphite is present, a representative or typical field is chosen. To rate a given 4 x 5-inch field at 500X, the average size of nodules is determined according to the chart, and the actual number of nodules counted. Supplementary charts may be prepared by the individual for estimating the number of particles, but charts of this nature need not be included in a standard graphitization chart for publication and general use.

For example, a rating of 15B means that 15 nodules of dispersed graphite with an average size of B were present in a 4 x 5-inch field at 500 magnification. A rating system of this type, while most favorably applied to dispersed graphite, is also applicable to slip plane or chain graphite.

In rating chain graphite the number of particles is not taken into consideration and therefore only the size is reported. For example, a rating of D means a chain of graphite at 500 diameters with an average width equivalent to the diameter of size D particles in the chart. The length of particles in chain graphite or the number of chains present in a specified area are not being evaluated at the present time. It will be observed in Fig. 1 that an index factor is shown on the chart for each classification. This factor was derived on the basis of the E size nodule representing a cube of graphite with a dimension of 0.25 in. on a side at 500 magnification. A cube of this size is equivalent to 0.0156 cu. in. of graphite and is shown as the $\int$ factor on the chart.

The $\int$ factor, therefore, represents the volume of one nodule of graphite at 500 magnification. The factor for E size nodule divided by the $\sqrt{10}$ is the $\int$ factor for a D size nodule, etc. The product of the number of nodules and the index factor for a given nodule size will, therefore, provide a relative graphite volume rating. Further, the amount of carbon in the steel which has been converted to graphite may also be calculated by this method. The chart and method of rating employed may, therefore, upon the basis of volume considerations, provide essential data for predicting the amount of graphitization to be expected on the basis of short-time tests.

Proper identification of graphite is particularly difficult in certain alloy steels in which complex carbides are present. Also the presence of alumina inclusions may give rise to misleading results. In order to determine whether a specimen contains graphite, it is important to preserve the inclusion intact during preparation of the specimen. Identification depends almost exclusively on the ability to see clearly such physical characteristics as color, texture and shape. Graphite under the microscope is not black, but dark gray, and when properly polished exhibits a granular or mottled structure.

It is recognized that an evaluation of the steel structure in terms of carbide size and distribution is of importance if creep results are to be intelligently appraised. The examination of all metallographic specimens for carbide structure suggests a system for evaluating the degree of spheroidization should be developed. This phase of the work, although not of immediate concern, will require a preliminary investigation before it is actually undertaken.

An investigation involving the exposure of a large number of different types of steel at elevated temperatures for a period of over 11 years has been described. Welded and non-welded specimens are included in the program. Testing methods to be used in evaluating the exposed material are described. After results are obtained for the 10,000 hour exposure, it will be possible to develop some tentative conclusions for certain grades of steel. As the work progresses, results will be reported. Although many aspects of the program are related to steelmaking, practically all of the data will be of interest to the user of tubular products for service at elevated temperatures. Graphitization and creep-rupture results will be particularly useful to the design engineer.

In an investigation of this type, it was necessary to obtain some of the steels from different sources. The authors appreciate receiving materials from: Carnegie-Illinois Steel Corp., Pittsburgh; Battelle Memorial Institute, Columbus, O.; Babcock and Wilcox Co., New York; Union Carbide and Carbon Co., New York; Titanium Alloy Mfg. Co., New York; Pittsburgh Piping and Equipment Co., Pittsburgh.

NEW LITERATURE

STAINLESS CLAD STEELS
By Lukens Steel Co., 412 Lukens Building, Coatesville, Pa. Four-page leaflet giving prices and standard extras for the company's stainless clad steels.

A DECADE OF INDUSTRIAL RESEARCH PROGRESS
By Armour Research Foundation of Illinois Institute of Technology. Annual report on the foundation's tenth anniversary gives history, financial summary, facilities and various projects undertaken by the group.

EEL BRAND HARDENED ANTIFRICTION METAL
By Murex Limited, Rainham, Essex, England. Booklet illustrates with microphotographs that microstructure of this lead base antifriction metal undergoes no material alteration even after repeated melting.

HOW TO USE AN INDUSTRIAL DESIGNER
By Society of Industrial Designers, 48 East 49th street, New York 17. Booklet contains 10 questions on industrial design often asked by businessmen. The answers have been prepared by the society and indicate the nature of this field.

METALLURGICAL APPLICATIONS OF X-RAY DIFFRACTION SPECTOMETER
By North American Philips Co. Inc., 100 East 42nd street, New York. A 16-page leaflet containing 15 photos, 23 charts, three tables and text material.

AMERICAN SAFETY STANDARDS
By American Standards Association, 70 East 45th street, New York 17. A 20-page booklet containing a list of approximately 200 standards covering safety and industrial health and giving a brief description of their contents.

MAKE 1947 PRODUCTS ON 1947 PRESSES

Speed, power, streamlining, are the features that distinguish modern automobiles . . . and modern presses.

Put the same efficiency into your production line that is engineered into your products . . . Designed for maximum utility, Danly presses have the mechanical accuracy and rugged construction that make for faster runs, more accurate stampings, longer die life, less downtime, and *greater production.* Enclosed construction saves floor space, lessens safety hazards—especially in rows or batteries.

Bring your production equipment in step with the products you manufacture. *Make 1947 Products on 1947 Presses.*

STEEL UNIT FRAMES

Danly Open Back Inclinable and Horning presses have unit frames of rugged one-piece all-steel construction. The frames, massive for presses of this type and size, lend great rigidity and resistance to deflection to these presses. Gears and driving members completely enclosed within the frame run in a spray of filtered oil.

Unusually long gibbing and two slide connections make for even pressure along the full length of the stroke—insure accurate alignment on large or progressive dies—prevent eventual loosening up or slide play due to uneven loads.

Danly O.B.I. and Horning presses range from 50 to 200 tons pressure in both single and two-point models.

DANLY
The Press for Modern Production

These double geared presses are typical of Danly's complete line of one, two and four point straight-side presses. Pressures range from 100 tons up. Special sizes and types engineered to specifications.

DANLY MACHINE SPECIALTIES, INC.
2100 South 52nd Avenue
Chicago 50, Illinois

Past and Present Developments in

OXYGEN GENERATION

Principles governing air liquefaction and significance of wartime and postwar developments from a commercial viewpoint are described. Low pressure process based on application of reversing heat exchangers is being employed in many industrial applications. Engineers contemplating large scale production and use of oxygen will benefit from information presented

By E. P. STEVENSON
President
Arthur D. Little Inc.
Cambridge, Mass.

SO abundant and important is oxygen that it seems somewhat strange that it was not the first of the elements to be identified, as in quantity it is nearly equal in amount to all the other elements combined—21 per cent of air, 89 per cent of water, and nearly one-half by weight of all the rocks forming the one-half mile crust of the earth. Air and water are the major industrial chemicals and have been so from the beginning of time; no element exceeds oxygen in industrial importance.

With the recognition by Lavoisier in 1783 of the role of oxygen in combustion there was laid the corner stone of modern chemistry. In his statement of what has become known as the Law of the Conservation of Mass is the concept of the chemical equation, "Nothing creates itself. . . In every operation or reaction, there is an equal quantity of matter before and after. . . There is only exchange or modification." Despite this early momentous observation and the further impact upon scientific imagination of the discovery of the function of oxygen in metabolism by the regenerative $CO_2 \rightleftharpoons O_2$ cycle, oxygen was available for man's purposes only in the naturally occurring condition of air until 1900, when Linde applied the process of rectification to liquid air.

Thus, a past of less than 50 years is in retrospect for high-purity oxygen. Air was first liquefied by use of the Joule-Thomson of the Joule Kelvin effect as the source of refrigeration. When air is allowed to expand freely, as through a porous plug in the Joule-Thomson experiments, there is a cooling effect. The utilization of this effect for liquefying gases on an industrial scale appears to have been attempted independently by Linde in Germany and by Hampson in England. The first Linde plant worked successfully in May, 1895, and it produced several liters of liquid air per hour; Hamp-

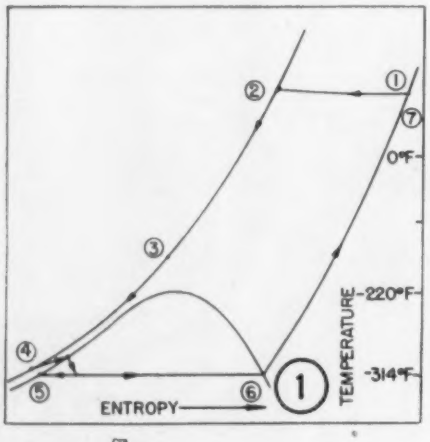


Fig. 1—Temperature-entropy changes in the Linde cycle

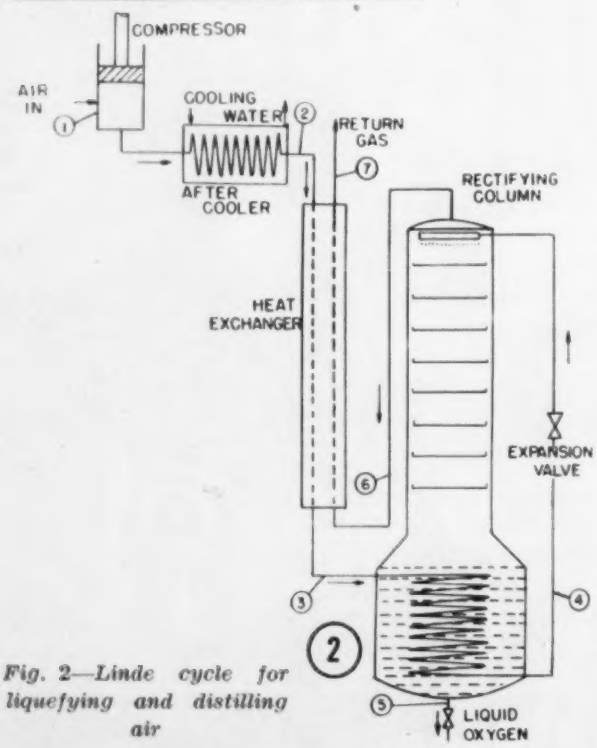


Fig. 2—Linde cycle for liquefying and distilling air

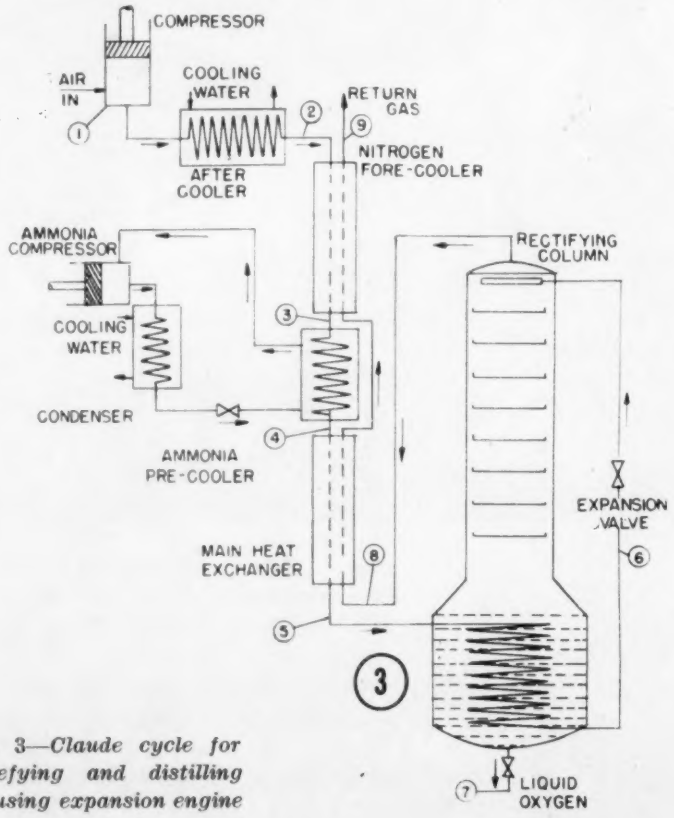
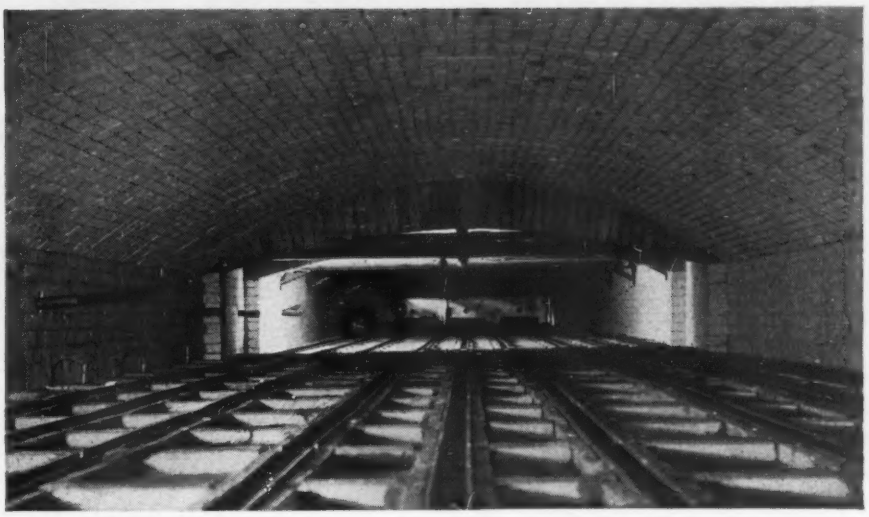


Fig. 3—Claude cycle for liquefying and distilling air using expansion engine

Photos courtesy Surface Combustion Corp.



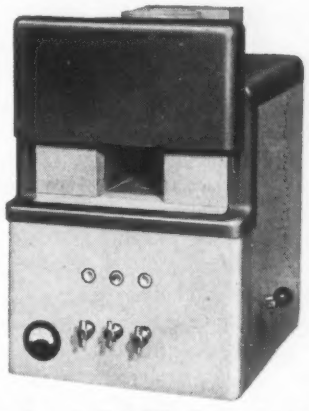
GIANT or DWARF

For lower operating costs, line your furnace with B&W Refractories

Minimizing maintenance and providing continuously superior performance are just two of the many ways B&W Refractories cut operating costs in all types of industrial furnaces—large or small.

In large malleableizing furnaces of the type shown above, the same B&W Refractories—after 11 years of continuous operation with high CO atmospheres—are still providing outstanding service, despite the added strain placed on them during the rigorous war years.

In small laboratory furnaces, accurate temperature control and the ability to perform precise pilot operations which can later be duplicated—are essential factors in holding down overall costs. Because of their superior insulating qualities, B&W Insulating Firebrick are widely used for this precision work.



Your local B&W Representative will be glad to show how the use of B&W Refractories may be profitable in your furnace—large or small.

R-291

B&W REFRACTORIES PRODUCTS

B&W 80 FIREBRICK • B&W JUNIOR FIREBRICK
B&W 80 GLASS TANK BLOCKS • B&W INSULATING FIREBRICK
B&W REFRACTORY CASTABLES, PLASTICS AND MORTARS

•

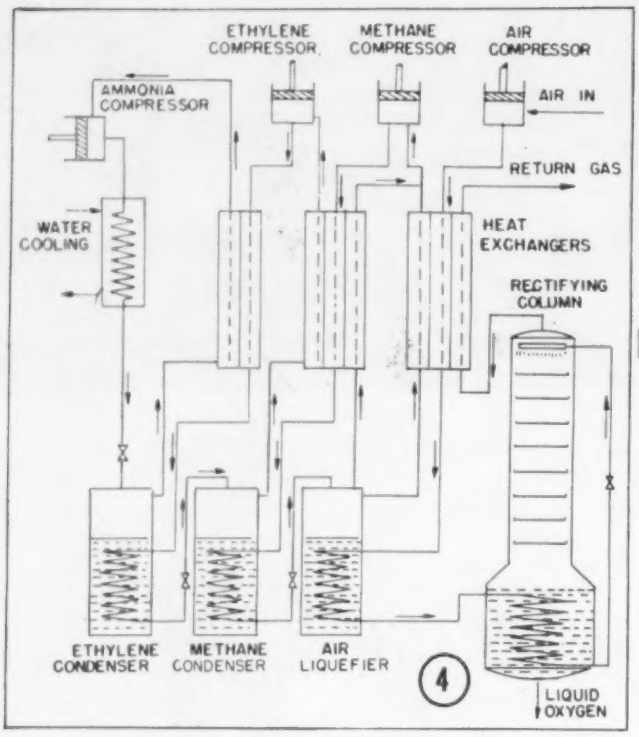
OTHER B&W PRODUCTS

Stationary & Marine Boilers and Component Equipment
Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers
Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N.Y.
WORKS: AUGUSTA, GA.

Fig. 4—Oxygen generator for use aboard aircraft. Housing and insulation are partially removed



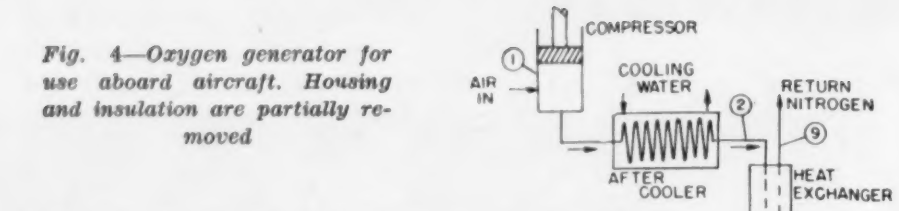


Fig. 5 — Cascade system for liquefying and distilling air

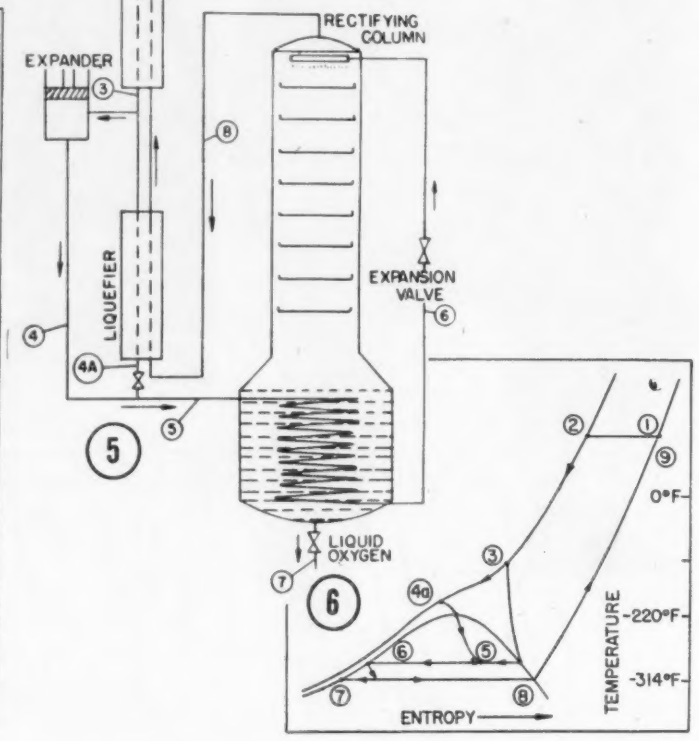


Fig. 6 — Temperature-entropy changes in the Claude cycle

son's apparatus was first exhibited in England in March, 1896.

Air compressed to about 3000 pounds per square inch passes through a closely wound coil of copper pipe and expands through a valve at the lower end. Cooling takes place on expansion in accordance with the principle just presented, and the cool gas travels back through the interstices of the coiled pipe, cooling the compressed gas inside it. The coil acts as a regenerator or heat exchanger, and the cooling of the air being thus progressive, a steady state is reached when a part of the air escaping from the valve liquefies. In 1902 Linde applied the process of rectification or distillation to the liquid air produced in his unit and thus laid the foundation.

The combination of these two steps (Linde)—that of liquefaction and distillation—in a single unit is shown diagrammatically in Fig. 2. The accompanying changes in state are shown in Fig. 1 on a temperature-entropy diagram. In its simplest form, the plant consists of a compressor, a heat exchanger, an expansion valve, and a single fractionating column. Air is compressed and cooled to substantially room temperature between 1 and 2. This is shown as an isothermal pressure increase in Fig. 1 The compressed air passes through a heat exchanger (2 and 3) and is cooled by the countercurrent cold effluent gases from the rectifying column. This process results in a large enthalpy decrease at constant pressure, thereby reducing the air temperature to about —160°F. A further enthalpy reduction at constant pressure is effected by heat exchanging the air with boiling oxygen at the base of the column 2 and 4. The high pressure air, now well below the critical temperature is flashed through the expansion valve, whereupon it is converted to approximately 75 per cent liquid and 25 per cent vapor. The liquid is admitted to the top of the column, where, as it trickles down countercurrent to the rising vapors, nitrogen and argon are preferentially evaporated, leaving substantially pure oxygen at the bottom of the column. The escaping vapors are warmed to room temperature at a constant pressure of about 1 atmosphere 6 and 7.

In the commercial practice today of the Linde process for producing oxygen it is common to combine with the Joule-Thomson effect an auxiliary refrigeration cycle, in which ammonia is commonly used. This results in considerable increased efficiency, as it is more economical to produce refrigeration in the region covered by the ammonia cycle than to depend entirely upon the less thermodyamically efficient Joule-Thomson effect. A combination of these two sources of refrigeration is shown in Fig. 3.

Another method of increasing the efficiency of the Hampson-Linde system, which was first suggested by Lord Rayleigh, involves the introduction of an expansion cylinder or turbine into the system in place of the expansion valve, thus making the gas do work on some mechanism outside the liquefier. In May, 1902, Claude succeeded in applying the principle of adiabatic expansion to the liquefaction of air. A plant for producing oxygen based on the Claude cycle so-called is shown diagrammatically in Fig. 5; the entropy changes are sketched in Fig. 6.

At a still later date the use of multiple refrigerants in stages was proposed for liquefying air at pressures used in rectification. Cascade systems, as these were called, would employ a series of orthodox refrigerant cycles, the coldest rejecting its heat to another, and so on, until the warmest rejects its heat to the atmosphere or cooling water. Such a process is shown diagrammatically in Fig. 4. The largest consumer-operated plant in the country—that of

A HABIT TO JOE...

"NEW IDEA" TO HIS NEPHEW

...YET BOTH WANT THE SECURITY your P.S. Plan Provides

HAVE YOU told all your new or recently hired employees about the benefits of the Payroll Savings Plan for the regular purchase of U. S. Savings Bonds? Wage earners, according to a recent nation-wide survey, want security more than anything else. They prefer security to big pay, soft jobs, authority, "success."

There is no surer way to this peace of mind than systematic savings. And what surer, safer, better means can your employees find than payroll allotments for U. S. Savings Bonds? Bonds that return $4 at maturity for every $3 they invest!

Your active support of the Payroll Savings Plan is an investment in employee contentment, in the citizenship of your community, and in the security of America's future. This is practical "employee relations" of the highest type and pays dividends of satisfaction to everyone.

Start a drive today for larger participation in the plan. Many employees may be unfamiliar with its advantages. If you want literature for distribution, contact your State Director of the Treasury Department's Savings Bonds Division.

New Savings Bonds Plan won't affect the P.S.P.

THE Treasury Department and the banks of America are making it possible for farmers, doctors, and other self-employed people to participate in "automatic" Bond buying by special arrangement with their banks. This extension of the Savings Bonds program is not a partial payment plan and is intended *only* for people who are not in a position to take advantage of the Payroll Savings Plan.

The Treasury Department acknowledges with appreciation the publication of this message by

STEEL

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

General Electric Co., at its Cleveland Wire Works—is of this type. The cycle makes use of an additional refrigeration stage in which nitrogen is used.

There are other so-called cycles for the liquefaction and rectification of air than those which are shown, though these are the classical ones. The number of cycles which can be conceived is almost infinite. Hundreds have been analyzed by the methods of thermodynamics in search of more efficient combinations, and there are in all some eleven principal independent variables which must be taken into account in the engineering design of a process based on any of these cycles. When the number of physical variables are combined with the purely engineering electives, the types and varieties of plants which can be engineered for the liquefaction and distillation of air are large.

It was therefore no mean undertaking, in 1941, to comply with the request of the Army, Navy, and Air Forces for a survey of the state of this art and an appraisal of the prospects of designing plants and building them to new specifications imposed by new conditions of use—those of war. Even before the United States entered the war, plans for an extensive development program were underway and shortly thereafter these plans were implemented by OSRD. The purpose for which the services needed oxygen were:

1. Submarine propulsion
2. For breathing of airplane crews at high altitude
3. For airplane "bursts of power"
4. For emergency welding and cutting on shipboard
5. Submarine air conditioning
6. Various medical uses in the field
7. Repair and maintenance of equipment in the field
8. Secondary fuel for rocket propulsion.

It had already been anticipated by the Air Forces, and the need acted upon, that truck-mounted generators would be needed in the field to produce oxygen, as it was no longer feasible to rely upon shipping oxygen in high-pressure cylinders made from critical materials, in which 7 pounds of metal were required to ship 1 pound of oxygen, while using our precious transport facilities. A major requirement of this program was high purity oxygen for aviators' use. With pressurized cabins only a glint in the engineer's eye, but large, long-range, high-altitude bombers already on the drafting boards, a project was authorized by the Air Forces for the design of an air-borne and operated unit to supply 150 cubic feet per hour of 99.5 per cent purity to meet the needs of a crew of ten, the unit to weigh, complete with auxiliary equipment, under 500 pounds. Nothing as small as this had ever been considered by engineers, and the weight specifications were literally in terms of pounds rather than tons.

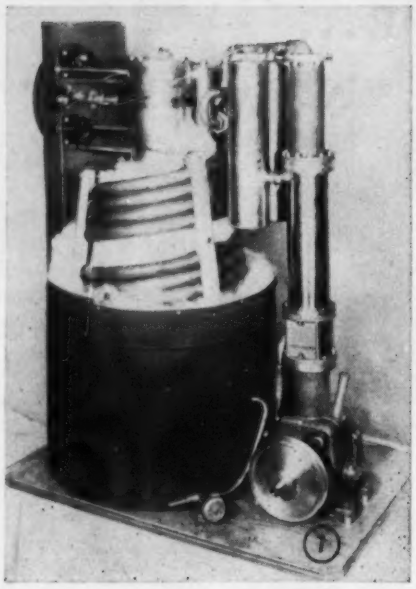


Fig. 7—Collins reversing heat exchanger

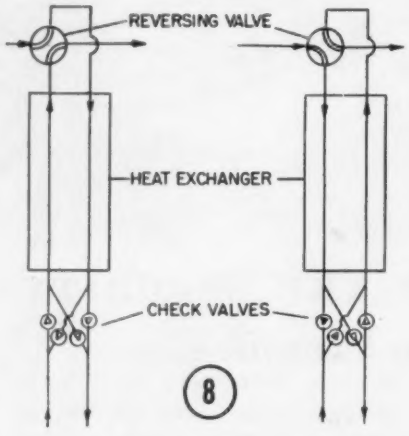


Fig. 8—Basic elements of a reversing exchanger

Another unusual assignment was that of a generator for oxygen designed for installations on a submarine to supply diesel engines with oxygen as a secondary fuel and thus permit their use under water with the elimination of storage batteries and motors. In terms of then existing commercial plants to comparable size a quick survey indicated the magnitude of the problem. The weights added up to the complete displacement of the submarine. The investigation of this problem was in fact the immediate occasion for the initiation of the OSRD oxygen program.

Of significance in this discussion of wartime developments are those which stem from the project of Drs. F. G. Keyes and S. C. Collins at Massachusetts Institute of Technology. To the latter we are indebted for the low-pressure process based upon the use of reversing heat exchangers. In the spring of 1942 Dr. Collins, in association with Dr. H. O. McMahon, was requested by the Air Forces to proceed with the design and construction of a test model of an air-borne or air transportable unit for emergency air bases and for operation on long-range, high-altitude bombers while in flight (Fig. 7).

Many of the specifications for this particular unit were important in connection with the design of units for other military uses, such as truck-mounted units of larger capacity, and are of great importance in many industrial applications. Chief among these is the use of the exchange system for effecting the purification of air from its minor condensable fractions, which comprise chiefly water and carbon dioxide along with traces of hydrocarbons which might be introduced into any system through the lubricants used in compressing.

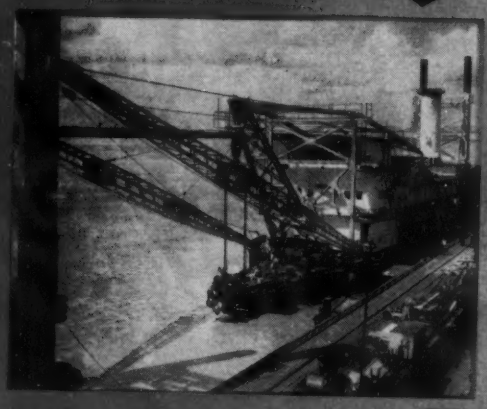
Prevailing commercial practice is to remove carbon dioxide, which is present in air normally to the amount of 0.03 per cent through contact with liquid caustic soda in suitable scrubbing towers; and water through use of a regenerative absorber such as silica gel or activated alumina. Use of physical means for purifying the air, particularly in large-scale commercial operations, is especially important in any low-pressure cycle. Chemical purification of air obviously becomes more expensive and cumbersome as pressure decreases owing to the increasing volume of air to be handled. The basic elements of a reversing exchanger are shown in Fig. 8

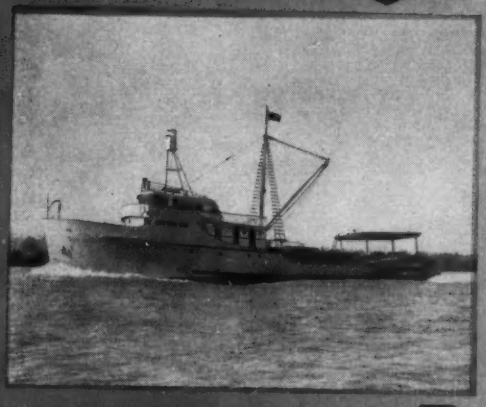
Impure air compressed to the desired pressure is admitted to one channel of a heat exchanger through a suitable 4-way switch valve. As the air passes through the exchanger, it is progressively cooled by the countercurrent stream, or streams, of returning gas. Water and ice are condensed out upon the extended surface of the channel and, at zones of lower temperature, oil vapors and solid carbon dioxide are deposited. Under these conditions the air passage would soon accumulate heavy deposits of impurities and would eventually become plugged.

Before any serious impediment to flow develops, the effluent and influent passages are simultaneously re-

(*Please turn to Page* 129)

BIG THINGS BUILDING AT AVONDALE





Giant STEEL suction dredges . . . modern STEEL tuna clippers for the Pacific . . . STEEL towboats and tugboats . . . all these and many more are building at AVONDALE! On the gulf coast, on the Mississippi—in the south AVONDALE is your answer for shipbuilding in STEEL!

Our many satisfied customers are the strong proof of our excellent workmanship. Each AVONDALE man, from the top, right down the line, is an expert and proud of his part on the AVONDALE team. Such teamwork as you find at AVONDALE is the answer to quality shipbuilding. Yes, we have . . .

2 BIG YARDS

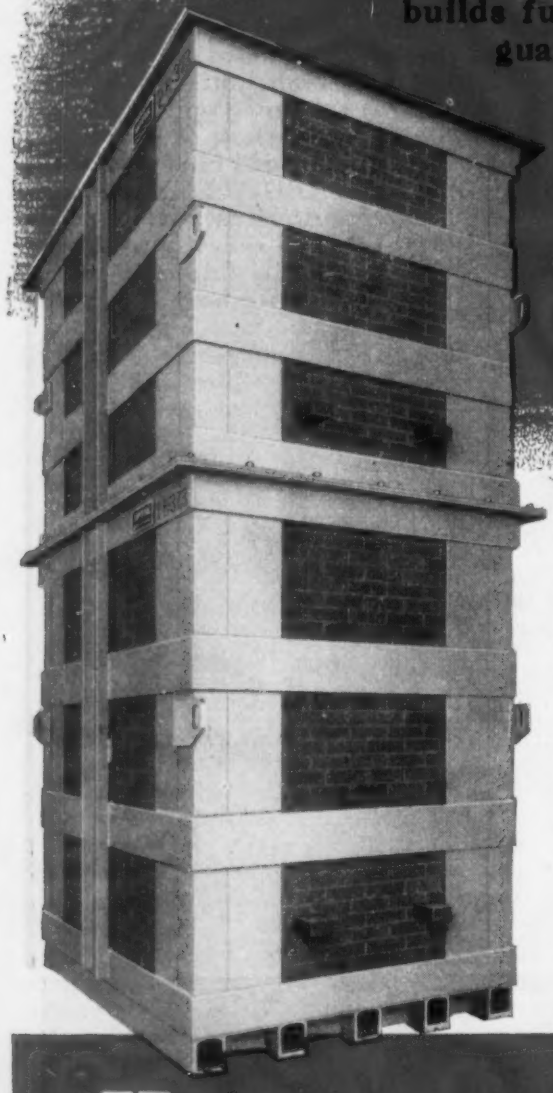
STEEL

AVONDALE MARINE WAYS, INC.

RIVER FRONT, NEW ORLEANS DISTRICT
TELEPHONES: WALNUT 8970 -- CHESTNUT 2475
MAIN PLANT: AVONDALE, LA.
QUICK REPAIR PLANT --- HARVEY, LA.
MAILING ADDRESS: WESTWEGO, LOUISIANA

For HEAT TREATING that requires . . . EXTREME DEPTH or EXCEPTIONAL LENGTH

ONLY UPTON ELECTRIC FURNACE DIVISION builds furnaces to such extreme size with a guarantee of uniformly accurate temperatures throughout.



The exclusive Sealed Electrode method of heating puts the heat in at the bottom of the pot. The same principle of design permits the electrodes to be placed *anywhere as required.*

This furnace is built in two sections, but additional sections to accommodate even longer work can be added.

Ask for complete information on UPTON ELECTRIC SALT BATH FURNACES now.

Upton Electric Salt Bath Furnaces are built to any length and for either batch or continuous (conveyorized operation.

Upton ELECTRIC FURNACE DIV.

7455 MELVILLE AT GREEN • DETROIT 17, MICHIGAN

See Upton Furnaces at Booth 536 . . . National Metal Exposition

Martempering Steel

(*Continued from Page* 96)

austenite. The equation may be corrected for other grain sizes by changing the factor which is multiplied by %C. This factor varies from 0.410 to 0.200 for ASTM grain sizes No. 1 to No. 10 respectively. Unless, however, conditions are unusual the assumption of a grain size of about No. 7 at the hardening temperature is valid and may be used with equation 1.

After making full use of a known composition of the steel to be treated, we must turn to the facilities that are to be used in treating. Let us consider the most important of these facilities for our purposes which is the quench bath. Each cooling bath has a certain ability to remove heat from the object being cooled. This cooling power of quench baths has been designated numerically as the "H" value (heat transfer equivalent). Below some typical H values for cooling baths are listed after Austin[4].

Quenching Medium	H Value
still air	0.02
moving air	0.05
still oil	0.30
still water	1.00

Having found the Ms, bainitic and pearlitic hardenabilities, and the H values of the available quenching mediums for the steel to be martempered, we are ready to apply some heat flow formulas to our data. Austin[4] has described some very useful formulas which apply nicely to the martempering calculations. They pertain to heat flow in the unsteady state as follows:

(3) U = Temperature at given time —Final uniform temperature/ Initial uniform temperature— Final uniform temperature.
Where U is the relative temperature which is the fraction of the total temperature ultimately to be achieved which remains to be accomplished at a given instant. U is unity at the start of cooling and zero at final equilibrium.

(4) X/L = 0 at center of piece.
X/L = 1 at surface of piece.
Where X is the center position; L is the radius or half-thickness; and X/L is a relative position. The length of the piece must be 10 or more times the half-thickness L in using these formulas.

(5) $\frac{\text{at}}{L^2} = r$ or $r L^2 = ta$ or $L^2 = \frac{ta}{r}$
Where a is the diffusion constant, which may be considered as 1.0 in.²/min. for steel; t is the time elapsed since start of cooling; and r is a factor found from HL, X/L, and U, using Russell's tables.

It may seem that the above equations are rather vague, but the exact use to be made of these equations will become clear in the examples to follow. Note that in equation 5 reference is made to Russell's tables. The tables taken from Russell (First Report of the Alloy Steels Research Committee, Special Report 24, of the Iron and Steel Institute, 1936) are used to calculate the rate of change of temperature or the temperature distribution within an infinite slab or cylinder. Part of these tables are reproduced here in Table II.

We are now in a position to take an actual example and see how to predict the suitability and determine the method of martempering a hypoeutectoid steel part.

Let us suppose that we are attempting to martemper three SAE 4140 axles of the following dimensions: 2 in. diameter by 20 in. long, 1 in. diameter by 20 in. long, and 1/2 in. diameter by 20 in. long. First we use the formula in Table I and find the Ms of 4140 steel to be 590° F. We then use equations 1 and 2 and find the pearlitic hardenability to be Di = 4.7-in. and the bainitic hardenability to be Di = 1.8-in. Using the pearlitic and bainitic Di's we may then find the time in cooling necessary to form pearlite and bainite as follows:

Time necessary for the formation of pearlite:

Di = 4.7-inches, Hardening Temperature (recommended for 4140) = 1550° F.

H value for still water @ 70° F = 1.00, L = 2.35 (see equation 4).

HL = 2.35, $U = \frac{T - 70}{1550 - 70} =$

TABLE II

TABLES FOR INFINITE CYLINDER OR ROD (AFTER RUSSELL)

Cylinder. HL = 1

r	Value of U when x/L is 0.0	0.5	0.6	0.7	0.8	0.9	1.0
0.04	N.E.	0.99013	0.97748	0.97638	0.91801	0.86467	0.79388
0.05	N.E.	0.98114	0.96416	0.93687	0.89640	0.84128	0.77338
0.06	0.99937	0.97070	0.95209	0.91929	0.87630	0.82022	0.75133
0.08	0.99179	0.94737	0.92134	0.88353	0.83982	0.78312	0.71637
0.10	0.97904	0.92337	0.89278	0.85423	0.80716	0.75080	0.68635
0.20	0.87208	0.79536	0.76197	0.72227	0.67709	0.62659	0.57162
0.30	0.75176	0.68071	0.65064	0.61545	0.57598	0.53242	0.48553
0.40	0.64340	0.58167	0.55568	0.52539	0.48151	0.45423	0.41491
0.50	0.54977	0.49686	0.47461	0.44868	0.41971	0.38786	0.35366
0.60	0.46963	0.42438	0.40537	0.38321	0.35846	0.33125	0.30204
0.70	0.40111	0.36246	0.34623	0.32731	0.30616	0.28292	0.25797
0.80	0.34259	0.30958	0.29572	0.27955	0.26150	0.24164	0.22034
0.90	0.29261	0.26442	0.25257	0.23877	0.22855	0.20639	0.18819
1.0	0.24992	0.22584	0.21424	0.20393	0.19032	0.17628	0.16073
1.2	0.18231	0.16475	0.15737	0.14877	0.13916	0.12860	0.11726
1.4	0.13300	0.12018	0.11480	0.10853	0.10152	0.09381	0.08554
1.6	0.09702	0.08767	0.08375	0.07917	0.07406	0.06843	0.06237
1.8	0.07078	0.06396	0.06109	0.05910	0.05402	0.04992	0.04550
2.0	0.05163	0.04666	0.04457	0.04213	0.03941	0.03642	0.03319
3.0	0.01067	.....	.....	.....	.....	.....	0.00686
4.0	0.00220	.....	.....	.....	.....	.....	0.00142

Cylinder. HL=2

r	Value of U when x/L is 0.0	0.5	0.6	0.7	0.8	0.9	1.0
0.04	0.99616	0.97812	0.95515	0.91569	0.85210	0.76204	0.64513
0.05	0.99748	0.96246	0.93229	0.88603	0.81709	0.72597	0.61304
0.06	0.99419	0.94464	0.90894	0.85695	0.78545	0.69450	0.58536
0.08	0.98101	0.90584	0.86198	0.80403	0.73165	0.64121	0.53906
0.10	0.95921	0.86560	0.81725	0.75655	0.68264	0.59691	0.50099
0.15	0.88075	0.76738	0.71627	0.65592	0.58664	0.50980	0.42687
0.2	0.78992	0.67738	0.62902	0.57321	0.51064	0.44152	0.37016
0.3	0.61929	0.52557	0.48753	0.44183	0.39255	0.33956	0.28383
0.4	0.48072	0.40711	0.37651	0.34178	0.30350	0.26244	0.21921
0.5	0.37240	0.31525	0.29150	0.26336	0.23493	0.20312	0.16974
0.6	0.28838	0.24409	0.22570	0.20485	0.18230	0.15762	0.13142
0.7	0.22329	0.18900	0.17436	0.15861	0.14083	0.12176	0.10176
0.8	0.17289	0.14634	0.13531	0.12281	0.10904	0.09428	0.07879
0.9	0.13387	0.11331	0.10472	0.09509	0.08442	0.07300	0.06101
1.0	0.10365	0.08773	0.08112	0.07363	0.06537	0.05652	0.04724
1.5	0.02884	0.02441	0.02255	0.02049	0.01823	0.01372	0.01315
2.0	0.00803	0.00679	0.00628	0.00570	0.00506	0.00438	0.00366
2.2	0.00481	.....	.....	.....	.....	.....	0.00219
2.4	0.00289	.....	.....	.....	.....	.....	0.00131
2.6	0.00173	.....	.....	.....	.....	.....	0.00079

Cylinder. HL=2.4

r	Value of U when x/L is 0.0	0.5	0.6	0.7	0.8	0.9	1.0
0.02	N.E.	0.99677	0.99072	0.97074	0.92295	0.83355	0.69204
0.04	0.99940	0.97474	0.94821	0.90230	0.82989	0.72883	0.59799
0.05	0.99760	0.95681	0.92230	0.86866	0.79108	0.68950	0.56409
0.06	0.99374	0.93660	0.89579	0.83677	0.75634	0.65557	0.53518
0.08	0.97591	0.89300	0.84370	0.77859	0.69623	0.59889	0.48746
0.10	0.95358	0.84830	0.79449	0.72704	0.64550	0.55248	0.44884
0.15	0.86579	0.74100	0.69529	0.61971	0.54472	0.46299	0.37512
0.20	0.76618	0.64459	0.59282	0.53327	0.46667	0.39543	0.32000
0.30	0.58385	0.48584	0.44521	0.39914	0.34828	0.29453	0.23816
0.40	0.44036	0.36566	0.33484	0.29998	0.26160	0.22115	0.17879
0.50	0.33147	0.27512	0.25189	0.22563	0.19676	0.16632	0.13445
0.60	0.24941	0.20699	0.18951	0.16975	0.14802	0.12511	0.10115
0.70	0.18764	0.15572	0.14258	0.12771	0.11136	0.09413	0.07610
0.80	0.14117	0.11716	0.10727	0.09608	0.08378	0.07082	0.05725
0.90	0.10621	0.08814	0.08070	0.07229	0.06303	0.05328	0.04307
1.0	0.07991	0.06631	0.06071	0.05439	0.04742	0.04008	0.03241
1.2	0.04523	0.03754	0.03437	0.03078	0.02684	0.02269	0.01834
1.4	0.02560	0.02125	0.01945	0.01742	0.01519	0.01284	0.01038
1.5	0.01926	0.01598	0.01463	0.01311	0.01143	0.00966	0.00781
1.6	0.01449	0.01203	0.01101	0.00986	0.00860	0.00727	0.00588
1.8	0.00820	0.00680	0.00623	0.00558	0.00487	0.00411	0.00332
2.0	0.00464	0.00385	0.00353	0.00316	0.00276	0.00233	0.00188
2.2	0.00263	.....	.....	.....	.....	.....	0.00107
2.4	0.00149	.....	.....	.....	.....	.....	0.00060

Isn't this what you want
in SAND CASTINGS?
1 FAST HELP on design
2 FAST PRICE quotations
3 LOWEST PRICE consistent with
4 HIGH-QUALITY castings
5 FAST DELIVERY
6 ALUMINUM'S BIG ADVANTAGES
You can get ALL 6 from the BEST source
for ALUMINUM SAND CASTINGS
ALCOA
A·C·A
ALUMINUM
ALCOA

PLUS

DEPENDABLE QUALITY

Today...Tomorrow...Always

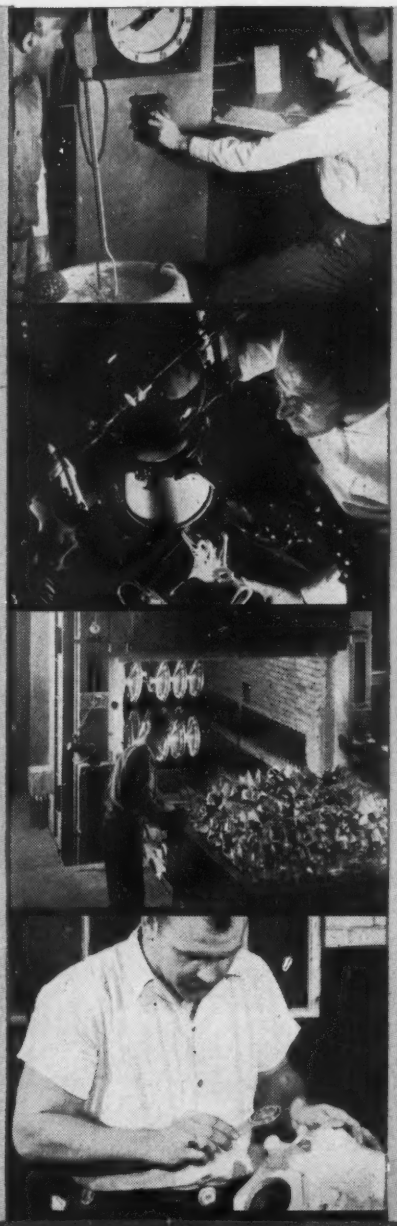
Let's "TALK TURKEY"

When you buy aluminum castings from Alcoa, you get the benefit of our 60 years of handling tough castings jobs, unusual jobs, the jobs that call for know-how, research, trail blazing, even plain trial and error.

Your castings job gets the benefit of all this knowledge, *plus* the finest in research and development work, *plus* every type of testing equipment, *plus* ultramodern foundries, PLUS the brains, skill, and hands of Alcoa's "old sand hogs" who have been making Alcoa Castings most of their lives.

Only from Alcoa do you get all these pluses! When you need sand castings, order them from Alcoa . . . your best source of the best aluminum sand castings today, tomorrow, always. Prompt service from one of Alcoa's four convenient foundries . . . at Bridgeport, Cleveland, Detroit, Los Angeles. Ready to serve you NOW on sand or permanent mold castings.

Write to ALUMINUM COMPANY OF AMERICA, Alcoa Castings Engineering Service, 2112 Gulf Building, Pittsburgh 19, Pa. Sales offices in 54 principal cities.



4 OF THE 12 POINTS THAT MAKE ALCOA CASTINGS BETTER

Melting temperatures **are controlled by precision electronic instruments to avoid overheating the melt. This is important to control grain structure in castings.**

X-Ray control **assures the proper location of gates, risers, and cores. Tells what's what inside the casting.**

Heat treatment **of aluminum castings is done in modern furnaces equipped with supersensitive thermostatic controls to hold temperatures within narrow limits. An order of castings receives identical heat treatment from batch to batch.**

Sharp-eyed, experienced inspectors **give each finished Alcoa Casting a thorough going over, make sure that all the castings you receive are sound and true, accurate in all dimensions.**

FIRST IN ALUMINUM

$\frac{T-70}{1480}$ (see equation 3).

when $T = Ms$ $U = \frac{590-70}{1480} = .351$

$\frac{at}{(2.35)} 2 = r$ from $\frac{at}{L^2} = r$ (equation 5) or $5.5r = t$.

Referring to Table II, cylinder HL = 2.4. Looking in the column for the center of the piece X/L = O we find that when U = 0.351 then r = about 0.48, so that t = 0.48 x 5.5 or t = 2.6 min. Therefore we have found that if more than 2.6 min is spent between the hardening temperature (1550° F) and the Ms (590° F) pearlite will begin to form in the piece.

Time necessary for the formation of bainite: Di = 1.8 in., and L = 0.9-in. same procedure as shown above is used. However, in this case it is necessary to interpolate in Russell's tables between the table for HL = 0.8 and the table for HL = 1, Table II. Using the equation $at/L^2 = r$, t is found to equal 0.68 min, or 41 sec. Therefore, if the time spent between the hardening temperature and the M_s temperature exceeds 41 seconds, bainite will form in the piece.

Now let us suppose that we have two types of quenching media available to us. One quench consisting of still oil at 70° F, having an H value of 0.3: and another quench consisting of molten salt held at about 40 degrees below the M_s of 4140, at 550° F, having an H value of 0.2. It is always a good idea to have a molten salt bath slightly below the M_s of the steel because after quenching, the temperature of the bath is slightly increased.

Let us first consider the 4140 axle 2 in. diameter by 20 in. long. In using the still oil quench we first calculate time necessary in oil to bring the center of the piece to the M_s temperature.

Using equation 3: $U = \frac{590-70}{1550-70} =$ 0.351, L is equal to 2-in./2, or 1.0 and H equals 0.3 so that HL = 0.3. Using the Russell tables for HL = 0.2 and HL = 0.4, we interpolate to find r for X/L = O (center), when U = 0.351; R is found to be 2.3.

Using equation 5: $\frac{at}{L^2} = r$, $\frac{1.t}{(1)^2} =$ 2.3, or t= 2.3 minutes, the time required for the center of the axle to reach the M_s. Let us now find what the surface temperature will be after the 2.3 minutes required to bring the center to the M_s.

Using equation 3: $U = \frac{T-70}{1550-70}$ or $U \cdot 1480 + 70 = T$.

Using equation 4: X/L = 1 (at surface).

Using equation 5: $at/L^2 = r$ or r = 2.3.

Using the Russell tables for HL = 0.2 and HL = 0.4, we interpolate to find U for X/L = 1 when r = 2.3; U is found to be 0.28 so that T = 0.28 × 1480 + 70 = 484° F, the surface temperature.

Now using the nomograph in Table I for a carbon content of 0.40 and an M_s of 590° F, it is found that at a temperature of 484° F the surface will be about 90 per cent transformed to martensite.

Recalling the three requirements for successful martempering, let us see what may be done with the 2-in. diameter axle by an interrupted oil quench.

It will be remembered that requirement 1 states that when the center of the piece reaches the M_s temperature, the surface shall be at a temperature no lower than that which will cause the formation of 30 per cent or less of martensite. Since the 2-in. axle is 484° F or about 90 per cent martensite when the center has cooled to the M_s, it is evident that we cannot meet requirement 1.

Requirement 2 states that very little, or no pearlite shall be formed in the piece. We found that it requires 2.6 min for pearlite to form in our 4140 axle and that the center could be brought to the M_s in 2.3 min. Requirement 2 can be met.

Requirement 3 states that only small amounts or no bainite be formed in the piece. We found that it requires 41 sec for bainite to form in our 4140 axle and that the center would not be at the M_s for 2.3 min. Therefore, it may be expected that considerable bainite would form, and hence requirement 3 cannot be met.

We may safely predict, then, that this 4140 axle cannot be successfully martempered by using an interrupted quench in still oil at 70° F.

In order to avoid repetition, Tables III and IV have been constructed to show the figures for use of a salt bath quench at 550° F, and figures for the axles of 1-in. and ½-in. diameters.

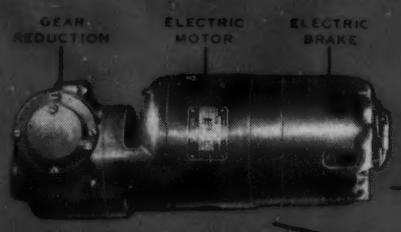
Referring to Table III column 1 is the type of steel, columns 2-8 give the analysis, column 9 gives the M_s calculated from composition, columns 10 and 11 give the hardenability Di's calculated from composition by equations 1 and 2, columns 12 and 13 show the time necessary for pearlite and bainite to form, calculated as previously described; column 14 shows the quenching media available with their H values shown in column 15, and column 16 shows the sizes desired to be treated. The numbers marked by asterisks give a cross reference to information used in Table IV by column number.

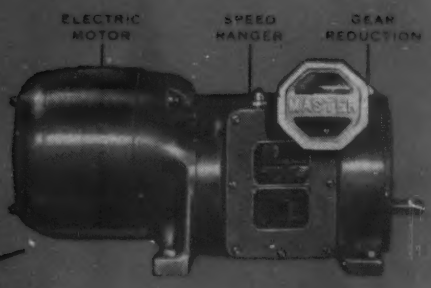
Referring to Table IV column 1 shows the size of the piece, column 2 the method of martempering, column 3 H value of the quench, column 4 radius or half-thickness L, column 5 product HL, column 6 value of U computed as described, column 7 the value of r for the center X/L = O when U and HL are known (found from Russell's tables), column 8 time required for center of piece to reach the M_s temperature, computed as described, column 9 value of U for X/L = 1 when r and HL are known, computed as described, column 10 surface temperature at time center reaches the M_s, computed as described; column 11 percentage martensite formed at surface when center is at M_s temperature, computed from the temperature given in column 10 and the nomograph of Table I and columns 12-14 inclusive, meeting of the three requirements for successful martempering.

Getting back to our sample axles, let us now observe Table IV and see what may be derived. It is found that the 2-in. diameter 4140 axle cannot be successfully martempered either by interrupted oil quench or

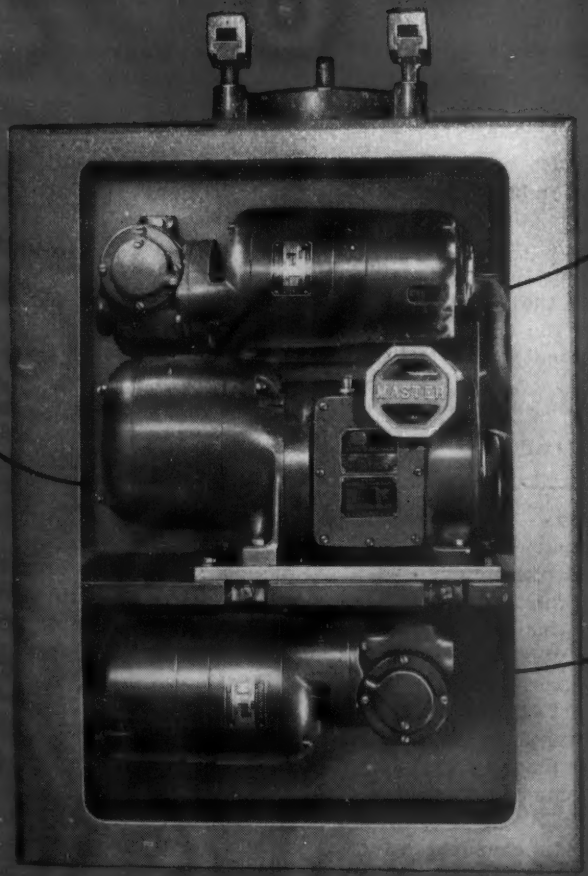
TABLE III

STEEL	C	Mn	Si	Cr	Mo	P	S	Ms	Pearlitic Di inches	Bainitic Di inches	time no P	time no B	quen	H	SIZE
SAE 4140	40	70	20	95	30			590 F	4.7"	1.8"	2.6 min.	41 sec.	still oil	.3	cylin. 10" long
													salt @ 550	.2	dia: 2", 1", ½"
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
								*11			*13	*14	*2	*3	*1





Easy does it



Don't put up with make-shift assemblies when it is so easy to get the RIGHT horsepower, the RIGHT shaft speed, the RIGHT construction features, the RIGHT mounting . . . all combined into one compact power package.

Master Motors, available in millions on millions of combinations of types and ratings, permit you to use a power drive on each job that's just right . . . a power drive that will add greatly to the compactness, appearance, and economy of each of your applications.

Use Master Motors to increase the salability of your motor-driven products . . . improve the economy and productivity of your plant equipment. They're the horsesense way to use horsepower.

THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO

TABLE IV

SAE 4140 dimensions	method	H	L	HL	U	C r	time C @ M	U srf	srf temp.	% M srf	Req. 1 % M srf	Req. 2 no P 2.6 m	Req. 3 no B 41 s
cylinders:													
2" dia. x 10"	interrupted quench in still oil	.3	1.	.3	.351	2.3	2.3 min.	.28	484 F	90	NO	YES	NO
	salt quench @ 550 F	.2	1.	.2	.04	8.5	8.5 min.			10 or less	YES	NO	NO
1" dia. x 10"	interrupted quench in still oil	.3	.5	.15	.351	4.1	61 sec.	.32	543 F	25	YES	YES	NO
	salt quench @ 550 F	.2	.5	.10	.04	16.5	4.1 min.			10 or less	YES	NO	NO
½" dia. x 10"	interrupted quench in still oil	.3	.25	.075	.351	7.9	29.4 sec.	.29	499 F	80	NO	YES	YES
	salt quench @ 550 F	.2	.25	.05	.04	33.	2.06 min.			10 or less	YES	YES	NO
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)

high temperature salt quench. The 1-in. diameter 4140 axle may be successfully martempered, providing we do not object to the formation of some bainite in the center of the axle by an interrupted oil quench; although it could not be martempered with a high temperature salt quench.

It is interesting to note that by comparing column 8 of Table IV with column 13 of Table III, a quantitative idea of the amount of bainite formed may be had. In the case of the 1-in. axle for interrupted oil quench, the bainite reaction would go forward for only 20 seconds. A draw treatment following martempering might well discount the injurious effects of the bainite in the 1-in. axle. The ½-in. diameter axle does not lend itself to martempering by an interrupted oil quench, but if bainite is not objectionable, it could be martempered in salt. Note here, the bainite reaction will go forward for as long as 82 seconds.

It can be seen from Table IV that we are able to predict success only in the case of the 1-in. and ½-in. diameter axles. Even this prediction of success carries reservation that bainite will form, and probably a draw after martempering will be desirable if good impact resistance is necessary in service.

We have precisely determined the method for the 1-in. and ½-in. diameter axles that may be martempered. In the case of the 1-in. axle, we shall use a still oil quench leaving the axle in the oil for 61 seconds or about 1 min. In the case of the ½-in. axle, we shall use a salt quench, held at 550° F, and leave the axle in the salt bath for about 2 min.

At this point let us qualify the system employed to make these predictions and determinations:

(A) Part must be a hypoeutectoid steel.

(B) Shape must be a cylinder, or a slab, or a shape wherein a mathematical interpolation between a rod and a plate may be made.

(C) Length must be at least 10 times the radius or half-thickness of the part.

With the above qualifications in mind, let us outline the way in which the prediction of the suitability, and determination of the method of martempering a hypoeutectoid steel part should be done.

(1) Obtain a set of Russell's tables.

(2) Find the H value of quenches available for the type of steel under consideration.

(3) Use the proper hardening temperature and be sure to get a homogeneous austenite of about grain size 7 for the steel selected.

(4) Set up a table as in Table III.

(5) Set up a table as in Table IV.

(6) Make a thoughtful interpretation of the table, as in Table IV and of its implications.

If the six steps above are used as a guide, a martempering job may either be considered or rejected. This preliminary appraisal has been made possible by the composite work and thinking of many experts and the man who takes full advantage of such an appraisal will not be disappointed.

REFERENCES

1. Technical Publication 1996. "The Temperature Range of Martensite Formation," by R. A. Grange and H. M. Stewart, *Metals Technology*, June, 1946
2. Technical Publication 2014. "The Relationship Between Transformation at Constant Temperatures and Transformation During Cooling," by G. K. Manning and C. H. Lorig, *Metals Technology*, June, 1946
3. Technical Publication 1926, "The Hardenability Concept," by John H. Holloman and L. D. Jaffe, *Metals Technology*, Jan., 1946
4. "Heat Flow in Metals," by J. B. Austin, ASM publication
5. (Table I) Metals Progress, Oct., 1946, p. 676-B
6. (Tables II-IV) Russell's tables, as taken from "Heat Flow in Metals," by Austin

Germans Welded Stainless To Plain Steel Plates

Large quantities of compound metal plates were produced for the German chemical industry during the war by hot-roll welding of stainless steel surface sheets to plain steel backing plates according to a report PE-52882 issued by the Office of Technical Services, Washington.

The report, which surveys rolling mill practices in 16 German firms, was prepared by J. C. Richards of the Australian Scientific and Technical Mission, for the British Intelligence Objectives Subcommittee.

The compound plates produced at the Deutsche Roehrenwerke A. G. at Muelheim, were made with one or both surfaces protected by stainless steel, copper, silver, brass or other metals, the report states.

Among the advantages advanced for compound plates made by hot rolling are economy in use of alloys, ease of fabrication, high strength combined with assistance to chemical attack, resistance of the backing plate to sulphur, and the feasibility of constructing plates with magnetic properties but with an austenitic surface layer.

In the process plates are built up in a pack; the pack is sealed by welding and piping is provided to pass a hydrogen atmosphere between the metal surfaces. After heating to rolling temperature, the pack is rolled in an ordinary plate mill.

The compound steel plates examined by the investigator averaged about 1 centimeter in thickness with a stainless sheathing of about 1 to 2 millimeters. He noted in one instance that the penetration of a plate by shrapnel did not separate the stainless sheet from the plain steel backing.

Materials Specification

(*Concluded from Page* 106)

can be met with standard materials. Proof that material requirements are not as inflexible as may seem, was brought out during the national emergency steel program. Under this program new, untried NE steels were used in place of previously used alloy and special steels. The new metals did not restrict the war effort to any great extent and in some cases better results were obtained.

Use of nonstandard materials is justified if the results from their use are so great as to counter-balance the higher cost, the difficulty of procurement, and the loss of all the advantages that go with materials made under specifications. Yet, the use of standard metals can be just as harmful as the disregard of standards. Many plants have extremely inflexible policies governing the use of standard materials.

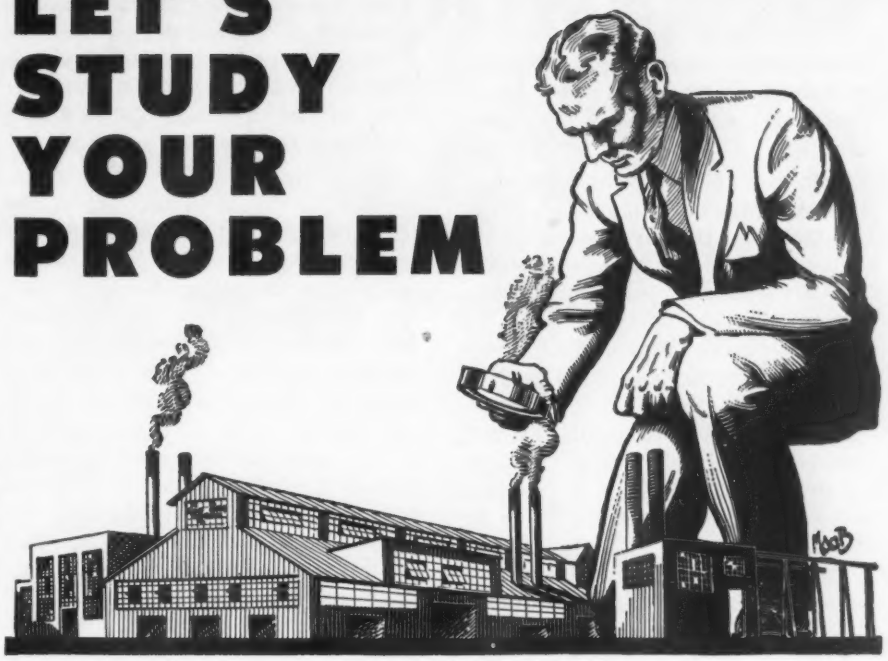
Specifications have gone far in standardizing production of metals; yet, it is unwise to assume that specifications provide the last word in precision. The ingredients and quantities of ingredients may vary considerably within a specification number; for that matter, allowances are provided in specifications for such variations.

No two heats of metal can ever be exactly alike, nor is there any need for them to be identical. Thus, it is short sighted to insist on using C 1030 steel when C 1029 is available and C 1030 cannot be procured. Actually, the C 1029 may be the same metal as C 1030. Such is the case because all components except carbon are identical for the two metals. C 1029 has a carbon range of 0.25-0.31 per cent, C 1030 has a carbon range of 0.28-0.34 per cent. If the carbon range of the former is high and that of the latter low, both metals will be identical. This is true of many material specifications.

And in many instances, materials made from entirely different components can be used interchangeably. This was proved conclusively with NE steels. The proof shown there applies still. If the same physical properties can be obtained from several different types of materials, there is no reason why the different steels cannot be used interchangeably.

This is the basic reasoning behind the "H" band steels. Here, physical properties are of first importance and chemical compositions secondary. The trend is more toward emphasizing physical properties derived from metals rather than from the precise components used in making metals.

LET'S STUDY YOUR PROBLEM



Is it a New Plant?

Is it Modernization?

Is it Increased Capacity?

Is it Materials Handling?

Is it Processing?

Is it Power?

SHREVE, ANDERSON AND WALKER

Engineers and Architects

DETROIT 26, MICHIGAN

Cold Extrusion

(*Concluded from Page 93*)

menting with various tool materials, including tungsten carbide types. There are indications of very long tool life.

Heintz is not deviating from usual American production standards in doing the job. By the use of extraordinary means for reducing friction, they are obtaining reductions in excess of 75 per cent.

The process is adapted to SAE 1010 and other carbon steels, as well as the low alloy steels.

The process, economically, is best suited to long production runs or to production of difficult sections which would be costlier to make by other methods.

For lubrication, Heintz uses chemical coatings in conjunction with special lubricants.

Evidence of the existence of the methods involved was located by W. W. Galbreath, formerly associated with the Heintz Mfg. Co., while in Germany on the staff of the Technical Industrial Intelligence Branch of the Department of Commerce.

Development of Extrusion

About 1934, the German government called together all of the manufacturers of steel cartridge cases and told them to develop the best method for making cartridge cases. In the course of the experiments, the idea of extruding, rather than drawing these parts was proposed. After some experimenting, a method of manufacturing steel cartridge cases which was actually a combination of extruding and drawing was worked out.

In using this new method, the first operation was approximately the same by either extruding or drawing. The second operation was performed by extrusion instead of drawing. Remaining operations were by the conventional drawing process. When using conventional drawing, six drawing operations and three anneal-pickle-bonderize operations were required.

With the new method, five press operations and two anneal-pickle-bonderize operations were needed. A saving of one press operation and one anneal-pickle-bonderize operation thus were effected. This extruding operation in the manufacture of steel cartridge cases was done cold, and was the beginning of the cold extruding industry in Germany.

Next a cylinder for airplane landing gears was developed. This is shown in Figs. 1 and 2. The sketch is not impressive as Fig. 2 is broken to keep it on a single page. One must realize that Fig. 1, which is 6 inches long, is extruded into Fig. 2, 25 inches long, in one operation, cold. Fig. 1 was made from a solid rolled bar.

In the first operation, a small depression is forced in the end of the bar approximately ⅜-inch deep. Object of this operation is to center the succeeding extruding operation. Part 1 is then formed by forcing a punch into the already started hole. On the first operation, it is possible to force the hole to a depth of two to two and one half times the diameter of the hole. In the second operation it is then possible to force the hole to a depth of five to five and one half times the diameter of the hole. This seemed to be the limit to which this operation could be carried out in Germany. As stated before, the billet is then extruded from a length of approximately 6 to 25 inches in one operation, cold.

One of the secrets of the cold extrusion seems to have been a chemical coating interlocked with the surface of the blank and all of the parts after they were annealed and pickled between operations. The Germans found that phosphatizing aids in lubricating the steel, so that it will flow in the die under pressure. More than 600 German firms are said to have had licenses for the use of phosphate coatings for cold drawing wire, rolling threads, cold drawing tubing and in various types of stamping work. Time of phosphatizing varied from 5 to 8 minutes on the blank to 2¼ to 5 minutes after the last pickling operation.

Many Lubricants Used

Rape seed oil was first choice as a lubricant in Germany although a wide range of lubricants was used including wool fat, tallow and fat soap.

Drawings in Fig. 3 show a number of other parts made by this cold extrusion process. It is very easy to see how many parts now made by other methods could be made by cold extrusion, particularly in high production quantities.

In developing the process for forming a fuse base in three operations a special double knuckle point press with two downward slides and with one upward action was designed. Pressure on each of the three rams was 600 tons. Blanks for the fuse base and other extruded parts were made by cutting off a specified length of bar stock. It was necessary to hold the weight of this blank within 3 to 4 per cent variation. This was done by sawing off the blanks.

A new method for accomplishing this same result by nicking the underside of the bar and then shearing it in the ordinary manner was developed, using a special die, designed for the ripple action knuckle press. One ram holds the bar tightly in place while the upward action nicks the bottom of the bar and the second downward slide shears the bar off to the desired length. By using this device, the variation in weight was said to be held to a minimum.

Steel Used for Dies

According to the Germans, the punch on the first operation failed first; it lasted for from 3000 to 4000 operations. Following is analysis of steel used by the Germans for punches on extrusion dies:

Element	Per Cent
Carbon	0.5
Chrome	1.2
Nickel	3.2
Silicon	0.25
Manganese	0.35

Steel was tempered at 820° C and quenched in oil. Rockwell test 54. On one type of extrusion work the draw ring broke down only after 7000 to 10,000 pieces had been made. If a reduction of 75 per cent or higher was attempted, the extrusion draw ring broke down quickly; if reduction was kept at 70 per cent or lower, the draw ring would stand up satisfactorily.

While the foregoing details of German use of the technique have been reported to American industry, the advancement of the art made by Heintz at their Philadelphia laboratories has not yet been disclosed in detail. William J. Meinel, president of the company, has indicated that their months of research have not only produced great progress in the degree to which extruding may be done, but widened the range of steels extrudable and developed new aids to expedite and control the process. The time and method of making available to U. S. industry the actual working details of the American adaptations and variations are said to be under discussion.

—o—

Known as the Risselt J-7 air eliminator, a high pressure vent valve for industrial applications is being marketed by Lodge & Shipley Co., Cincinnati, O., for the pressure range up to and including 125 lb. Valve is built of 2 1/8-in. brass bar stock and is made in two parts.

Oxygen Generation

(*Concluded from Page* 118)

versed so as to cause the waste nitrogen from the rectifying column to return through the passages, which have become partially fouled, and the impure air to enter through the alternate passages. The returning nitrogen, because of its much greater specific volume, is able to evaporate the deposits laid down in the previous half-cycle. By switching streams with a constant period of about 2 to 3 minutes, both channels are thereby kept free of deposits.

Under some conditions temperature differences between effluent and influent streams become so great that the evaporative capacity of the returning nitrogen is insufficient to remove completely impurities deposited from the air stream. It then becomes necessary to augment the enthalpy of the returning stream in order to restore an operable temperature difference between streams. This was first effected by circulating a portion of the cold low-pressure stream over the cold end of the heat exchanger where the temperature difference between streams is normally maximum. This expedient has been referred to as thermal unbalance and has been described in a number of publications dealing with reversing exchangers.

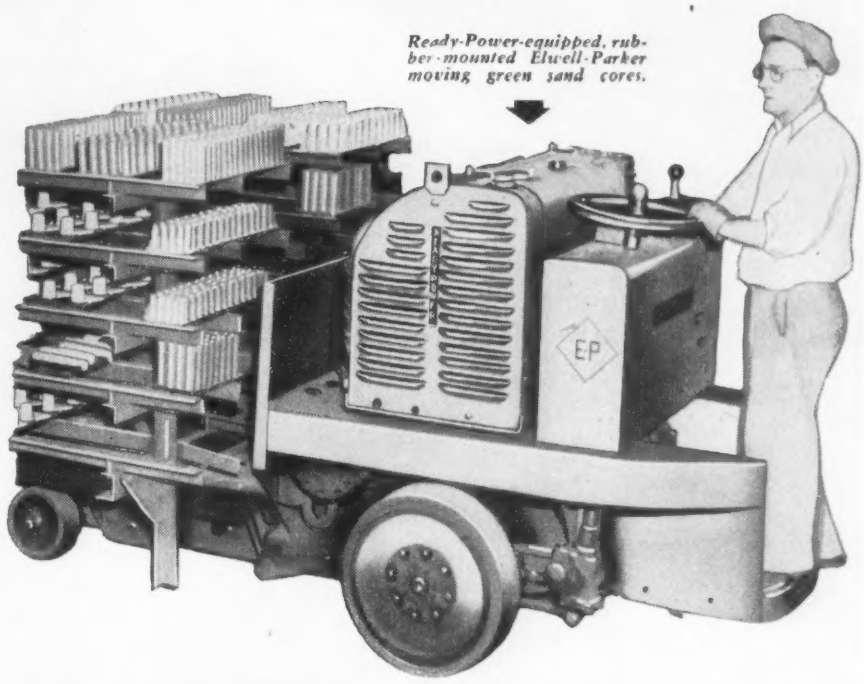
(*Continued in next issue*)

Nylon Acts as Shock Absorber in Conveyor Belt

The transverse cord breaker—said to be one of the most vital factors in the ability of conveyor belts to withstand excessive gouging, heavy loading and extremely severe service—is now being made of nylon in Cord conveyor belts made by B. F. Goodrich Co., Akron, O. Consisting of a layer of parallel cords embedded in rubber laid transversely on the belt and acting as a shock absorber, it retards gouging or cutting because of its lengthwise stretch, the company says, keeping the rubber in the cover and carcass from being distorted beyond its elastic limits, thus increasing belt life.

Adhesion of the rubber carcass of the belt to the cover is said to be increased by the transverse breaker. Tests have shown that the nylon cord has as good or better adhesion qualities than the cords previously used. Among the advantages resulting from the use of nylon is higher tensile strength — Goodrich reporting that tests have proved it to be at least 55 per cent stronger.

READY-POWER for smooth operation



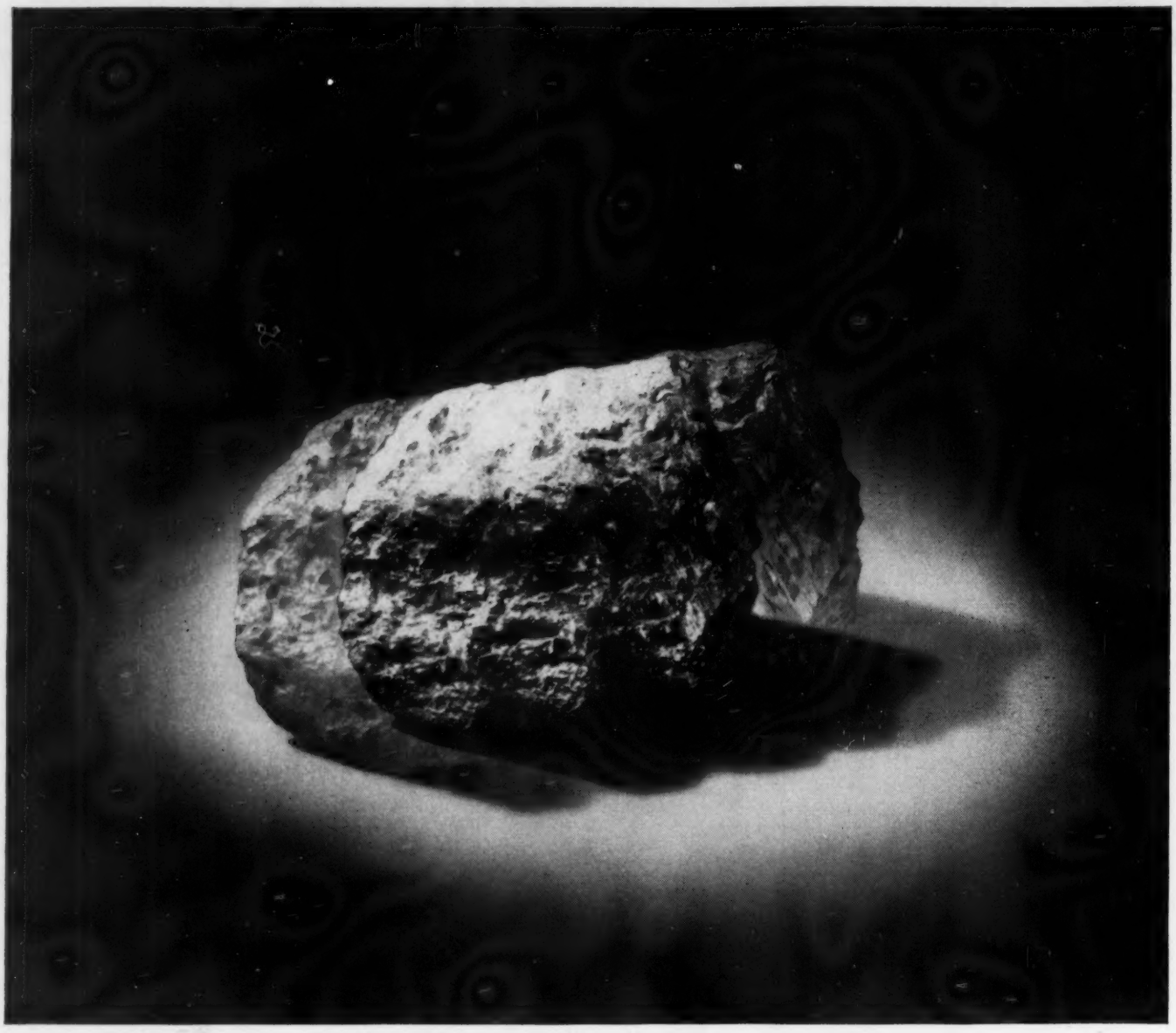
Ready-Power-equipped, rubber-mounted Elwell-Parker moving green sand cores.

If it's smooth, electric truck operation you want, there's nothing better than Ready-Power gas-electric Power Units. Ready-Power offers *more* than regular electric truck operation because dependable electric current is generated right on the truck chassis in unlimited amounts. That means your trucks are always ready to operate at top speed . . . 'round the clock if necessary. Install Ready-Power Units on any make electric truck. Write for details.

Ready-Power-equipped Mercury truck loading an annealing oven.

THE READY-POWER CO.

3824 Grand River Ave., Detroit 8, Michigan



Lump of coal about to get a move on

This lump of coal has the shakes.

So has all the rest of the coal in any carload that's being emptied by a Robins Car Shakeout.

You see, actual results prove that the cheapest and fastest way to unload a car of stubborn material is to shake it out.

The new Robins Car Shakeout unloads fifty- to seventy-ton cars "broom-clean" in as little as 90 seconds. It unloads them no matter how tightly the load is packed. And it even empties loads that are frozen . . . lets them flow freely and quickly through the hopper doors.

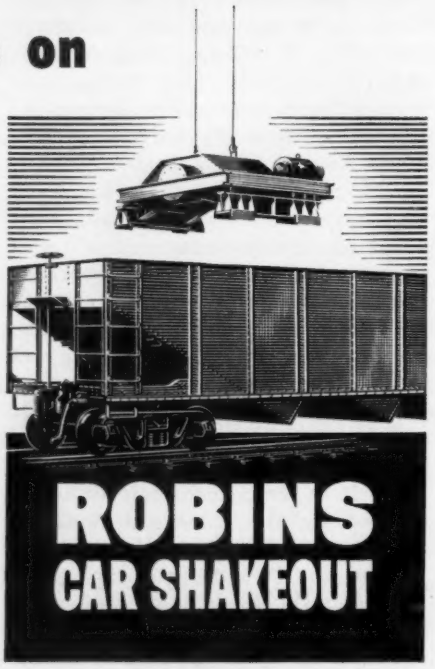
Actual field operations by hundreds of users prove that this new method of unloading hopper cars is as much as twelve times faster than manual unloading methods.

When you can unload hopper cars that fast you practically eliminate demurrage charges!

You save hours of labor, too. All that's required is an operator to lower this portable unit onto the car and press a button. The Shakeout does the rest without damage to the car . . . without danger to the operator.

For full details about this revolutionary new way to unload hopper cars in a hurry, write Robins today!

A note on your company letterhead will bring you this new booklet about the Robins Car Shakeout. Tells how this new concept in car unloading saves time, manpower and money. Dept. O-8.



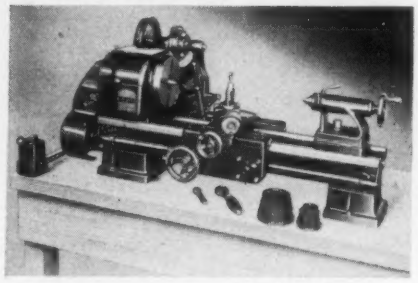
ROBINS CONVEYORS DIVISION, Hewitt-Robins Incorporated, Passaic, N. J.

New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 138

1. 9-Inch Lathe

With a 9-inch swing and 18 inches between centers, the new lathe made by Logan Engineering Co., 4901 West Lawrence Ave., Chicago 30, Ill., is adaptable to precision manufacturing operations, general machine shop and tool room work, etc. It has a ball bearing spindle mounting, making it suitable for high speed operation.



The two V-ways and two flat ways of the bed are precision ground to within 0.0005-inch of parallel. Massive construction insures steadiness on heavy cuts. Self lubricating bronze bearings protect vital wear points.

2. Boring Bars

Boring of holes having a length to diameter ratio as high as 8 to 1 is possible with boring bars of solid cemented carbide, announced by Carboloy Co. Inc., Detroit. Eight sizes in two styles are offered. Solid bar with a carbide boring tool brazed into a recess in one end of the bar is the first style made in one size. Other style consists of a solid carbide bar carrying a steel insert at one end of the bar in which the carbide boring tool is held and adjusted with set screws. Bar is furnished either finish ground or in unground condition.

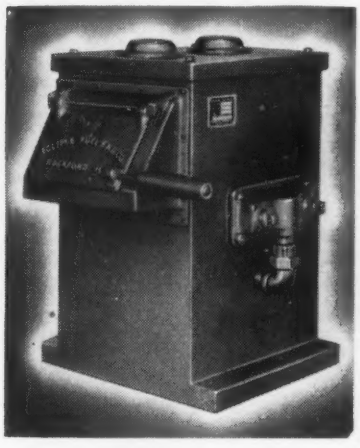
3. Toggle Clamp

Man's normal pressure on the handle of the toggle-action clamp made by Knu-Vise Inc., Detroit, is capable of exerting a pressure of 1350 lb at the extreme end of the toggle bar. Because the base comprises an integral front bracket and back support, the deflection at the spindle is not more than 3/16-in.

Called Jumbo, clamp is supplied with complete spindle assembly, but this may be removed and replaced by any special pressure pad to meet the user's particular requirements. In upright position the V-1100 clamp measures 14⅝-in. high with an overall length of 9⅞-in. It locks with toggle action when pressure is applied to work.

4. Bench Type Furnace

For use in small tool shops and other shops not requiring elaborate or expensive heat treating equipment, the redesigned model 1-B small oven furnace, made by Eclipse Fuel Engineering Co., 718 South Main St., Rockford, Ill., has a furnace shell of heavy gage welded sheet with reinforcements to provide a rigid structure. Heavy cast sections are used at all points subjected to heat.



Designed for use where low pressure air (from 10 to 16 ounces) is available, combustion equipment includes burner and Mckee proportional mixer which provides single valve temperature control. Temperature range is 1400 to 1600° F. Unit comes completely assembled, only connection to gas supply and attachment of cord from motor to lamp outlet being necessary to operate.

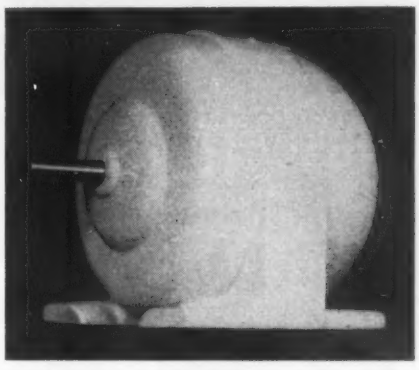
5. Magnetic Pulley

Designed for use as head pulley in belt conveyor systems, the permanent magnetic pulley, introduced by Homer Mfg. Co. Inc., Lima, O., serves to remove ferrous metal particles and pieces from materials being conveyed. Pulleys, with their intense magnetic fields, are built of cast aluminum and steel and are made in standard diameters above 10 in. and in widths in multiples of 6 in. All are amply ventilated to dissipate any heat created by belt slippage or friction.

6. Continuous Duty Motor

Use of simplified design and high tensile strength alloys to reduce weight is a feature of the continuous duty, drip-proof type, 3-phase, 60 cycle motor for operation on 220/440 volts, manufactured by Electra-Motors Inc., 1110 North Lemon St., Anaheim, Calif. Offered in ¼, 1/3, ½ and ¾ horsepower, motor has double sealed bearings which are lubricated for life.

Shaft end-play is restricted and both stator and rotor cores are easily accessible. It may be operated horizontally or vertically. Base has slotted holes for belt adjustment. Load bearing frame is one-piece construction.



7. Tap Grinder

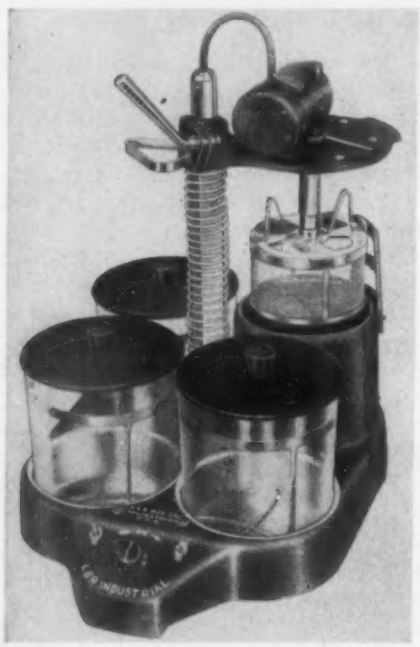
Model 110 tap grinder, made by Henry B. Boggis & Co., 1279 West 3rd St., Cleveland 13, O., will sharpen and relieve chamfers, grind flutes and spiral or gun points. It has a capacity of No. 2 machine screws to 1½-in. hand taps and ⅛ to 1 in. pipe taps, by use of three sizes of chamfer and flute heads. Taps with 2, 3, 4, 5, 6 or 8 flutes and right or left hand threads can be sharpened.

Taps are held in collets by the shank so that they may be recondi-

tioned after the center has been destroyed or the tap broken. Any chamfer from 5 to 60 degrees may be obtained. Permanently mounted diamond dressers are furnished for truing the chamfer sharpening wheel and forming the radii of the flute sharpening wheel.

8. Parts Cleaner

Ball bearings are used in the specially designed motor and in the shaft that supports the work basket of the small parts cleaning machine offered by L & R Mfg. Co., 577 Elm St., Arlington, N. J. Work basket measures 3 3/8-in. deep and 5 1/2-in.



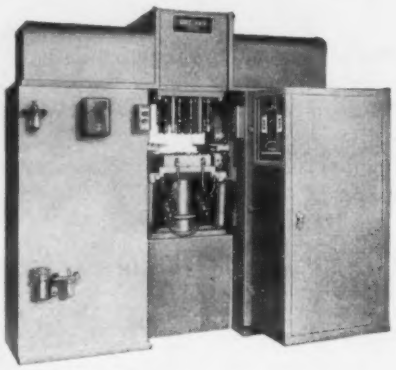
in diameter. In it fit triple nesting baskets so that various parts may be cleaned without mixing. Unit also has controlled reversing action.

Machine is completely self contained and cleans, rinses, polishes and dries parts which are too delicate for manual handling. Aluminum cups under jars assure protection for pyrex containers and perfect alignment.

9. Multiple Welder

Hot upsetting, spotwelding and projection welding of intricate small parts to a steel panel are possible in one operation with the type MGMS-8 multiple welder manufactured by Sciaky Bros. Inc., 4915 West 67th St., Chicago, Ill. The welder is an open throated assembly of individually controlled welding guns; transformers and control equipment are compactly mounted on either side.

Parts to be welded are placed in a locating jig by one operator while another operator places another loaded jig over the retractable lower platen. Releasing the jig drops all parts into lower dies. Meanwhile, operator on other side of machine is placing panel in position. Next an air cylinder then moves the platen up until a special contact is made with conductor from transformer and upper electrodes, shaped to fit the parts, are in welding position.



Welding can be set to any sequence by means of a telephone jack type control board. Operation on a perfectly balanced load on all three phases of the supply line is achieved through the "three-phase" system.

10. Shop Tractors

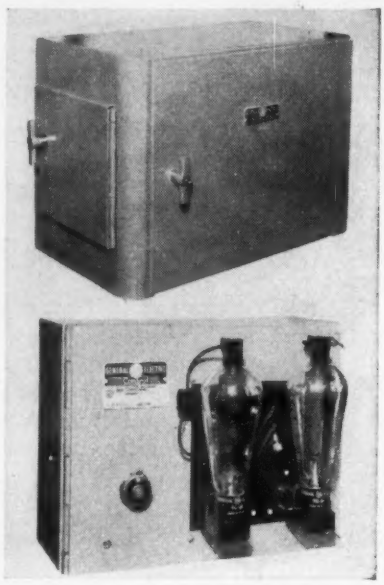
Manufacture of a line of extra heavy duty Shop Mule tractors—models H120, H90 and H75—is announced by W. F. Hebard & Co., 336 West 37th St., Chicago 9, Ill. All three models are 120 inches long, less coupler. Models H90 and H75 are equipped with single pneumatic drive tires and are 68 inches wide. Model H120 has dual pneumatic drive tires

and is 86 inches wide with an overall hegiht of 60 inches. Power is furnished by an International GRD 233 6-cylinder engine of 68.5 horsepower at 2400 revolutions per minute.

Drawbar effort is 7500, 9000 and 12,000 pounds for the H75, H90 and H120 models respectively, giving this series a towing capacity on dry level concrete ranging from 150 to 240 tons. Pneumatic drive tires and heavy cast rear fenders assure traction in all weather. Wheel sanders may be installed for operation on snow and ice.

11. Welder Heat Control

Designed for use with ignitron contactors or nonsynchronous control combinations not having a heat control feature, a new phase shift heat control accessory for resistance welding machines is announced by General Electric Co., Schenectady, N. Y. For use when the power supply is 230 or 460 v, a stepless range of from 20 to 100 per cent (40 to 100 per cent on 230 v) is provided by the



control, preventing high transient starting currents.

Control eliminates need for multitap welding transformers or supply autotransformers, although a welding transformer arranged for series-parallel primary is desirable for very wide heat range. It provides a quick, convenient means for changing heat at any time. Dial may be mounted in easy reach of operator or located elsewhere by extending the two-wire cable. Swing-out hinged panel is enclosed in a steel case.

12. Spring Threading Tool

Made by Guarantee Tool Co. Inc., 96 Maple St., West Orange, N. J., the Ideal threading tool holder is made to hold a single point cutting tool and is so constructed that the cutting tool retracts in a horizontal plane away from the work when the pressure is too great for efficient cutting. In this manner tool point breakage and damage to the work piece is prevented.

Because of horizontal movement of tool holder element less clearance is

required at the cutting point of the tool, thus providing greater support to the cutting surface. Heavier cuts are also possible. Shank of the 1-B is properly proportioned and mixed but shank and side guards are surface hardened and treated to prevent rusting.

13. Electric Hand Truck

Completely electric, the 6000 lb platform model power Jacklift, made by Lewis-Shepard Products Inc., 293 Walnut St., Watertown 72, Mass., is controlled entirely from the handle head and may be operated with the handle vertical or in any other position. No movement of handle is required to start, stop, change speed or lift and lower the load.

Finger tip push-button controls in handle provide a saving of time. Vertical handle operation allows maneuvering in close quarters. When handle is released, "deadman" type electric braking control stops the motion of the truck. Master drive unit of truck is interchangeable with other power units when servicing is required.

14. Die Casting Machines

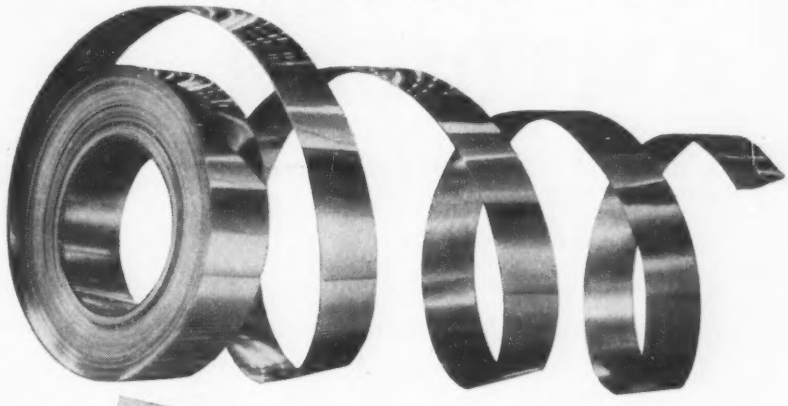
Among the latest die casting machines developed by Hydraulic Press Mfg. Co., Mt. Gilead, O., is a new machine of 150-ton capacity which features a 150-ton die clamp and a cold chamber injection system for aluminum and other nonferrous metals in that melting range. Injection system consists of a double acting ram directly coupled to the water-cooled injection plunger which delivers into the die at high speed, the molten metal previously ladled into the cold chamber. The injection chamber, as well as the entire injection assembly, may be mounted either at the center line of the stationary die platen or 4 inches below.

Machine shown here, is known as the model 150A. It is equipped with both manual and semiautomatic controls of the injection plunger and

ANSWERING THE QUESTION:

WHAT IS (OR "ARE") N-M

1. Nickeloid Metals are *finished* raw materials — beautiful and durable finishes of chromium, nickel, brass or copper . . . heavily plated to such base metals as steel, copper, zinc, brass or aluminum.
2. Nickeloid Metals are available in all gauges and tempers, and in a wide range of sheet sizes and coil widths.
3. Nickeloid Metals may be worked and fabricated — with reasonable precaution and skill — without injury to their highly polished surfaces, the same as most basic metals.
4. Nickeloid Metals, being FINISHED metals, require no further plating, painting or lacquering, or polishing — thus eliminating costly piece-plating after fabrication.



HERE'S YOUR FREE FACT BOOK ON FABRICATION OF NICKELOID METALS

A factual, data-filled brochure that may suggest new production economies to you.

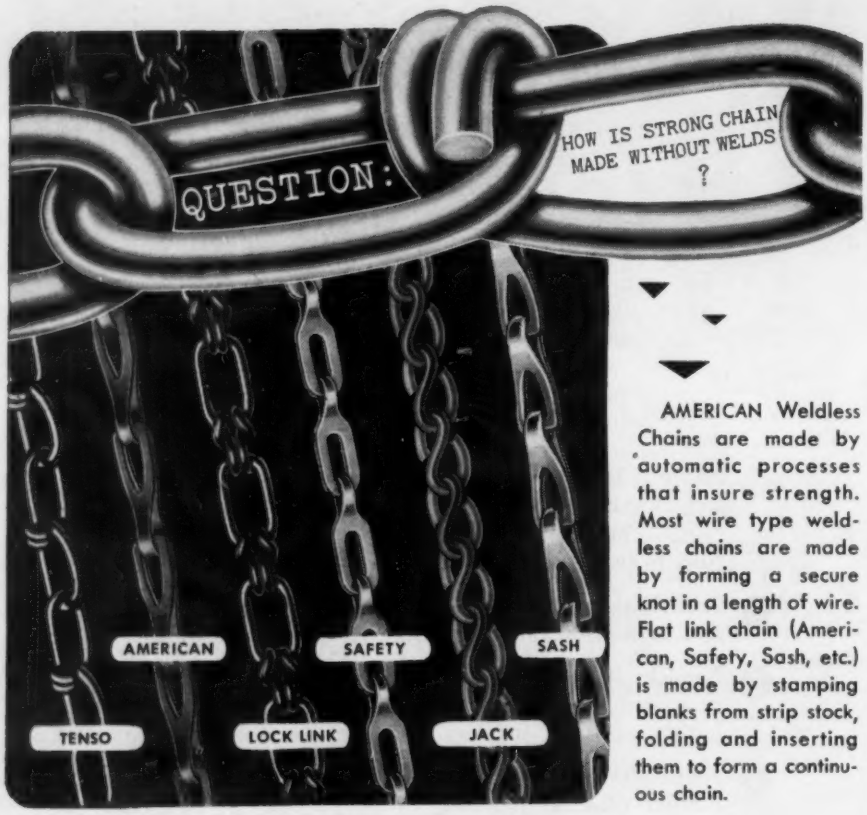
Send for your copy today!

AMERICAN NICKELOID COMPANY

Established 1898

PERU 1, ILLINOIS

STRONG... ENDURING... ADAPTABLE



AMERICAN Weldless Chains are made by automatic processes that insure strength. Most wire type weldless chains are made by forming a secure knot in a length of wire. Flat link chain (American, Safety, Sash, etc.) is made by stamping blanks from strip stock, folding and inserting them to form a continuous chain.

AMERICAN
WELDED AND WELDLESS CHAIN

Shown here are some of the more popular AMERICAN weldless chains. AMERICAN CHAIN also offers a complete line of electric welded and fire welded chain—chain fittings and assemblies—repair links—cotter pins—hooks. Whatever your chain needs, get in touch with your AMERICAN CHAIN distributor.

ACCO

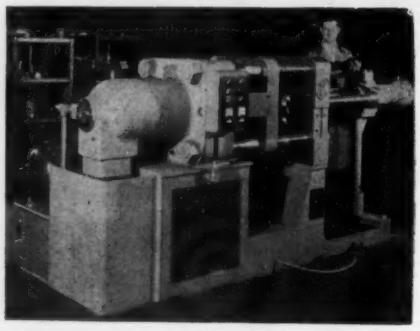
York, Pa., Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety

clamp platen movement. Main operating valves are solenoid operated and may be operated in either manner, with a multiflex timer controlling the various sequences of the cycle.

Model 150-Z differs from the above model in the incorporation of an integral injection system of the submerged plunger gooseneck type for die casting zinc, lead, tin, antimony

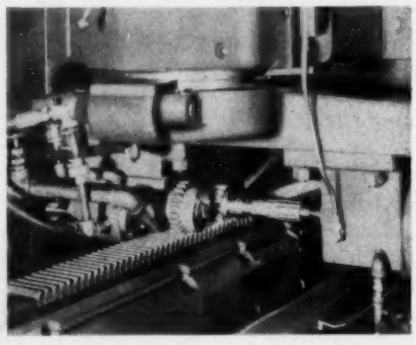


and other metals. Clamp ends of both machines are identical.

Machines of 400-ton capacity have been redesigned for more production. Model 400-A is full hydraulic as is the 30-ton injection ram which has an injection speed of 200 feet per minute. The power unit is integral with the machine, which has 42 inch daylight and 16 inches of clamp travel. It has a central hydraulic ejector which may be operated either manually or automatically. Design of 400-Z machine is basically the same as the 150-Z machine, excepting for a larger, 900-pound metal pot and a greater shot capacity. Injection speeds are 20 per cent faster and injection pressures are 50 per cent greater.

15. Gear Finisher

Simultaneous finishing of two or more gears in tandem is possible with the rack type gear finisher developed by Michigan Tool Co., 7171 East McNichols Rd., Detroit 12, Mich. Hydraulic in operation, the machine



has a duplex head and tailstock, permitting one gear to be mounted between centers and another on a stub arbor immediately ahead of the centers. The hydraulic clamping provided for the centers is interlocked

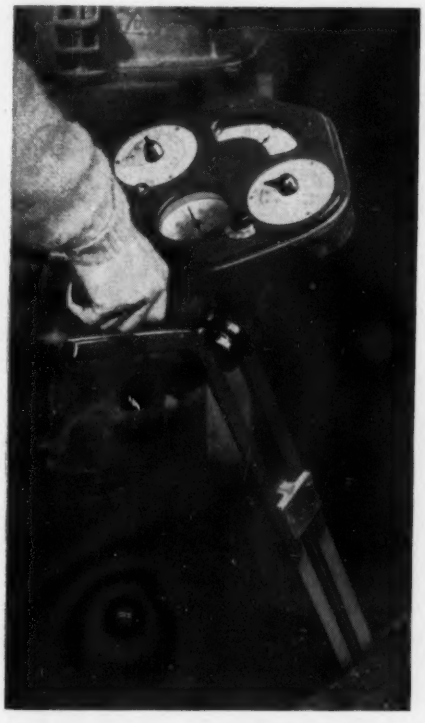
with the machine operation; it cannot be started until gears are mounted.

To shave two or more gears at a time, the gears must be of the same pitch and pressure angle. They may be of different diameters and face width. Gears are mounted on a crossed axis to the axis of the serrated rack blades and are given a transverse motion while rolling in mesh with the reciprocating rack. Cycling of machine is completely automatic.

The above item appeared in this section of the October 6 issue with a picture of a die casting machine. It appears now with the correct illustration.—ED.

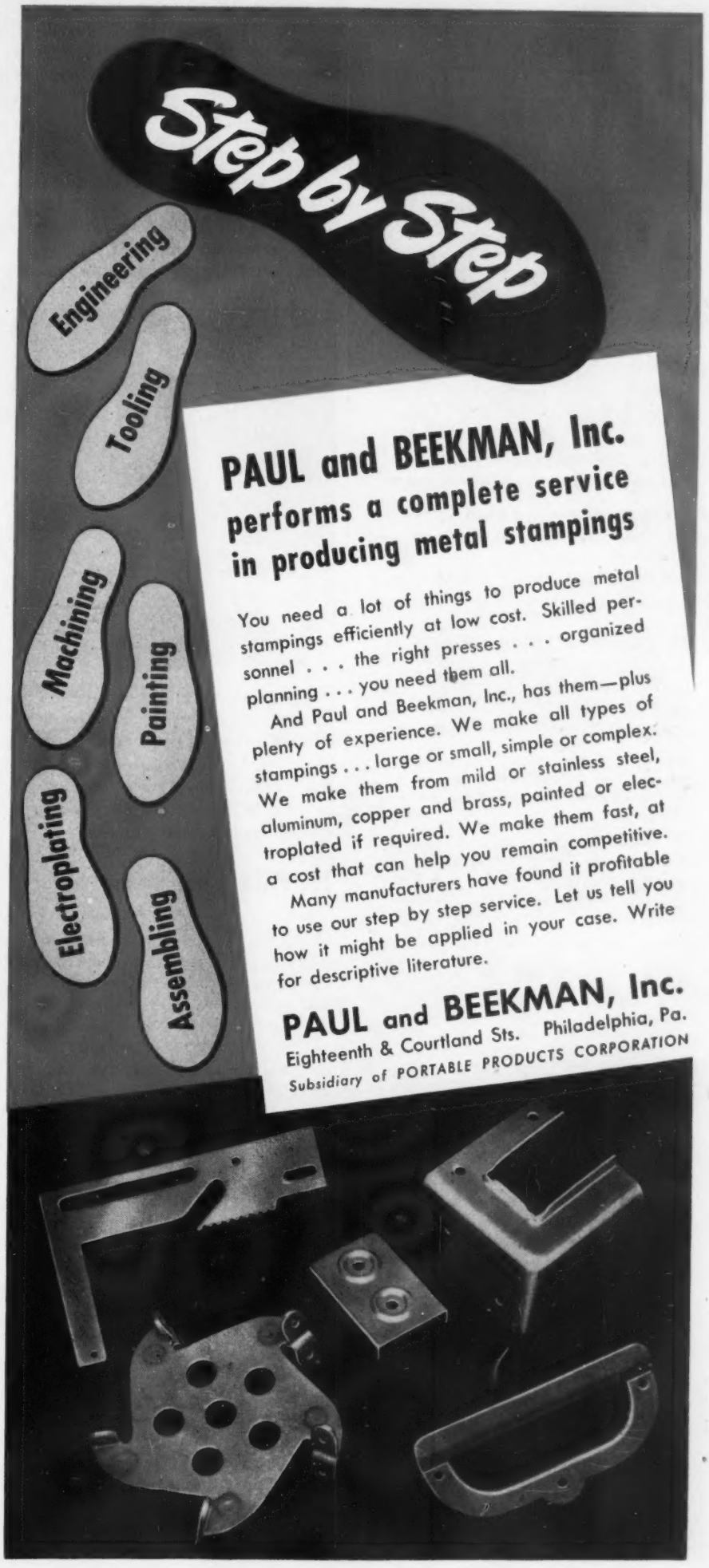
16. Moisture Tester

Fast and accurate, a new portable electric moisture tester, made by Harry W. Dietert Co., 9330 Roselawn avenue, Detroit 4, is operated by



pushing it into the sand pile or bin or in a sample can as small as a quart, the sample being held within a curved sampling plate and compressed to a definite degree by a spring loaded arm. The sand slides through the sample cut and wipes the electrodes as the instrument, called the Moistmeter, is pushed through the sand. Tests may be made on depths up to 30 in. from surface.

Instrument is equipped with a dial thermometer to measure temperature of sand being tested. A dial pointer is moved to agree with thermometer reading, this making possible adjustment to compensate for temperature.


Step by Step
Engineering
Tooling
Machining
Painting
Electroplating
Assembling
PAUL and BEEKMAN, Inc.
performs a complete service
in producing metal stampings
You need a lot of things to produce metal stampings efficiently at low cost. Skilled personnel . . . the right presses . . . organized planning . . . you need them all.
And Paul and Beekman, Inc., has them—plus plenty of experience. We make all types of stampings . . . large or small, simple or complex. We make them from mild or stainless steel, aluminum, copper and brass, painted or electroplated if required. We make them fast, at a cost that can help you remain competitive.
Many manufacturers have found it profitable to use our step by step service. Let us tell you how it might be applied in your case. Write for descriptive literature.
PAUL and BEEKMAN, Inc.
Eighteenth & Courtland Sts. Philadelphia, Pa.
Subsidiary of PORTABLE PRODUCTS CORPORATION

DANIELSON

TWO-WAY AUTOMATIC SAFETY CHECK

eliminates hazard

of whipping air-lines

SAVES

TIME and LABOR—PNEUMATIC TOOLS—REDUCES COMPRESSOR EXPENSE — **detects, eliminates air-leaking equipment**

THE CHAMBER OF THIS VALVE IS CAST IN ONE PIECE

HIGH PRESSURE TESTED

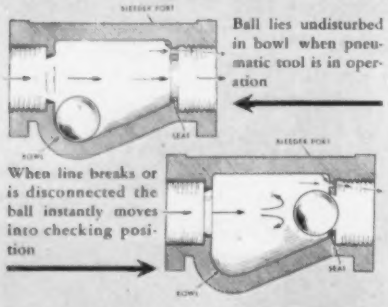
Needs no servicing or adjusting

NO SPRINGS—NO WEAR—NO GASKETS

- One moving part
- Automatic both directions
- Operates dependably under all pressures

This valve permits sufficient volume of air to operate all types of pneumatic tools commonly used in shipyards, mines, oil refineries, factories

Cross sections below show the valve in operating and in checking position


Ball lies undisturbed in bowl when pneumatic tool is in operation
When line breaks or is disconnected the ball instantly moves into checking position

The bleeder port, as shown in drawings, creates the reverse automatic action

The DANIELSON Safety Check Valve is used and recommended by many of the larger industries on the Pacific Coast.

Reduce Your Compressor Expense

Investigate!

Descriptive literature mailed upon request

Danielson Safety Valves, Inc.

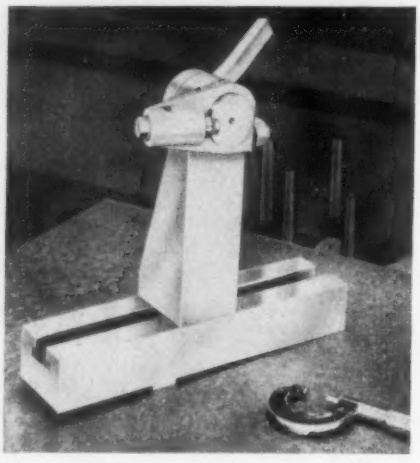
716 MacDonald Ave.
RICHMOND
CALIFORNIA

TRADE MARK

Percentage of moisture is read immediately upon insertion into sand. Calibration is necessary as electrical characteristics vary for each type of sand.

17. Wheel Dresser

Made by Erickson Tools Division, 2309 Hamilton Ave., Cleveland 14, O., the Tru-Matic wheel dresser for universal grinders is made of high grade steel, correctly hardened and accurately ground. Built for constant use without danger of weakening or breaking, the dresser does not need to be removed for use on the machine. An easy movement of the locking lever permits diamond to be turned back out of the way.



18. Pillar Post Units

Pillar post unit for die sets made by A. W. Grunow Inc., Orange, N. J., contains phosphor bronze contractable bushings which are adjustable for fit and future wear. Units make a more accurate and smoother operating die set because of the "diamond bored" special steel alloy housings, accurate to a squareness of 0.0001-in. in 6 in.

Tapered post ends make them easy to remove for die grinding. A die set within 0.001-in. across the corners may be built in 2 hours using these units and a pair of plates. They may be transferred from job to job without loss of accuracy.

19. Punch Presses

Nine, 10, 19 and 30-ton fast feed open back inclinable punch presses, made by Fast Feed Machine Corp., 223 Kunkle Bldg., Ashtabula, O., feature fingertip variable speed control which makes possible 180 to 500 press strokes per minute. Other features are: Main bronze bearings, running from front to rear of crankshaft, with ample oil grooves; flywheel with ball and thrust bearings; and crankshaft which can be run in oil bath or grease at high speeds.

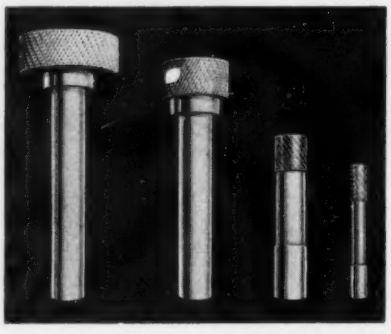
Main frame of presses is of high tensile cast iron. Legs are of welded construction. Safety clutch is of mechanical swing dog type. Clutch mechanism may be set for single stroke or continuous. Crankshaft bearings and pitman rod bearings have alemite fittings.

20. Explosion-Proof Switches

Hermetically sealed by fusing metal to ceramic, 5, 10, 15 and 20 amp mercury switches developed by Mercontrol Inc., 278 Pearl street, New York 7, are especially adapted to explosion-proof areas. They provide a mercury-to-mercury contact without arcing, pitting or burning. Operation is at 110 and 220 v ac or dc in an ambient temperature of 100° C. Pressure of hydrogen inside the switch to quench the arc is above atmospheric pressure.

21. Carbide Grinding Burs

Developed for internal and jig grinding and blending or fine finishing by off-hand grinding, new carbide grinding burs, manufactured by M. S. Ford Mfg. Co. Inc., 780 West First St., Davenport, Iowa, work



equally well on soft materials or on steel hardened to 65 rockwell C. Burs are precision ground, producing a uniform and concentric tool.

Burs enable faster removal of material, hold hole shape and tolerances without dressing or set-up adjustments and provide a finer finish without loading. They are stocked in standard sizes from 1/16 to ¾-inch tool diameter for operation in precision grinding equipment at conventional grinding speeds.

22. Synthetic Seal

Meeting requirements of Army-Navy Specification An-P-79 for O-ring packing and gasket material for use in static and dynamic sealing of aircraft hydraulic system elements, a synthetic rubber material, PS1-30-5, is

a formulation of Research Special Products Division of Parker Appliance Co., 17325 Euclid avenue, Cleveland. It satisfies tests for wear, heat and cold resistance, physical properties and aging and for precision manufacture.

23. Cable End, Center Holder

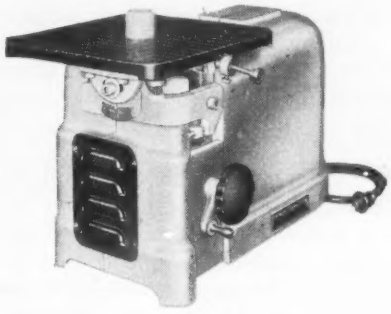
Various sizes of electrical cables may be securely held with the combination cable end and center holder announced by Mosebach Electric & Supply Co., 1115 Arlington avenue, Pittsburgh 3. Cables are clasped by tightening the U-bolts, each of which individually grips the cable. Holders are made to handle 211,600 to 500,000, 500,000 to 1,000,000 and 1,000,000 to 1,500,000 cm cables, each size holding cables 1 per cent larger or smaller.

24. Visual Control Board

A mechanical visual control board, the Trendicator, is manufactured by L. M. Osborne Co., 45 Second street, San Francisco, and used for graphically presenting and portraying facts and data in a correlated manner. Board has colored plastic tapes which may be progressed from either side of the board and a master guide chart which enables maintenance of a picture of current conditions and, at the same time, builds up a permanent historical graphic record. It is offered in two sizes with provision for 75 and 25 items, both with two colored tapes each.

25. Profile Grinder

Introduced by Milwaukee Chaplet & Mfg. Co., Milwaukee, Wis., is a bench type high speed profile grinder designed for precision grinding of in-



terior and exterior profiles, curved, odd and irregular surfaces, etc. Its work table may be tilted 15 degrees in any direction, the angle of inclination being indicated by a graduated dial and pointer. Table also has a 3¼-inch vertical adjustment actuated by a crank handle.

Table surface is serrated to catch grindings. A built-in diamond dresser keeps wheels free and fast. No cleaning or assembling of loose parts is required preparatory to wheel dressing. High-speed motor drives vertical spindle at 20,000 revolutions per minute and provides ample power for grinding wheels from ⅛ to 1½-inches in diameter. The spindle reciprocating ⅛-inch vertically 100 times per minute results in free-cutting, even-wearing wheels. Removal of two bolts permits front half of housing to be lifted off, exposing entire mechanism.

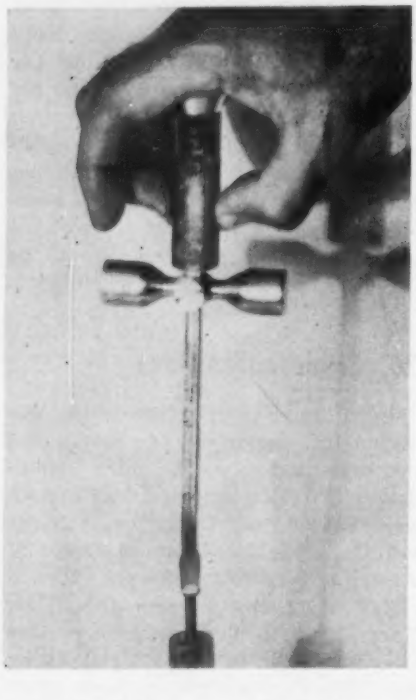
26. Combination Tool

Doing four other jobs besides serving as a screwdriver, the Spindriver, manufactured by Skamser Spindriver Co., Los Angeles, has a non-slip handle of Lumarith celulose acetate made by Celanese Corp. of America, New York 16, N. Y. and supplied by Hopp Press Inc., New York. Free turning machine screws may be wound in and out rapidly by revolving the shank. Inertia of cross bar flywheel greatly increases the

A Complete Warehouse Service for...
SHEETS • PLATES
STRIP • STAINLESS STEEL
TIN PLATE • BARS • SHAPES
WIRE PRODUCTS • ALLOYS
Adequate Stocks!
Prompt Shipment!
Tri-Boro Steel Supply Co., Inc.
133 LINCOLN AVE., NEW YORK CITY • MOTT HAVEN 9-3469
An Affiliate of
CHARLES A. KOONS & CO.
WORLD-WIDE EXPORTERS • 620 FIFTH AVENUE, NEW YORK CITY
Tri-Boro Steel Supply Co., Inc.

number of revolutions of the screwdriver.

Cross bar, after a little smoothing and rounding of edges, is converted into a torque bar which may be gripped by hand for turning power.



Cross bar is in form of two hammer heads. Hammer also acts as a prying fulcrum for the screw driver. Hammer heads are flat so that they may be used as anvils.

27. Disk Sander

A baffled air intake through the rear handle assures a large volume of clean, cool air over the motor of the Metalmaster Kool Grip disk sander and polisher manufactured by Bradford Machine Tool Co., Cincinnati, O. At the same time the air intake keeps the handle cool and provides

the operator with a comfortable grip on the tool.

Use of double reduction gears permits use of a small spindle gear and decreases centrifugal force, allowing grease better to cling to the gears. Gleason cut spiral bevel gears and the helical cut intermediate gears are made of chrome-molybdenum steel, heat treated for correct hardness. All ball bearings have permanent lubrication.

Three models are produced: Seven-inch heavy duty sander; 9-inch standard duty sander; and 7-inch polisher. Standard equipment includes a conductor cable, detachable side handle, backing pad, three disks for the sander and a lamb's wool bonnet for the polisher. Standard motor is a 110 volt, alternating or direct current model, but also available is a 220-volt, alternating or direct current model.

DEVELOPED BY . . .

28. Electroline Co., 4121 S. LaSalle St., Chicago 9, Ill., a hook-end fitting for wire rope which is secured to rope by an integral connector in the hook. Stationary and swivel types are manufactured for 10 rope sizes.

29. Unistrut Products Co., 1013 W. Washington Blvd., Chicago 7, Ill., pipe support embodying one roller assembly which will support 1 to 12-inch pipe. Supports are mounted on framing members.

30. Defiance Automatic Screw Co., Fort Wayne Rd., Defiance, O., a carbon steel, 750 pound test union for low or high pressure piping. Made with brass seat, it is offered in sizes up to 1 inch.

31. Thomas Laughlin Co., Portland 6, Me., a clevis hook which utilizes a bolt, slotted nut and cotter pin for fastening. Hook may be supplied with safety latch or reversed jaw on order.

32. Hexacon Electric Co., 139 W. Clay Ave., Roselle Park, N. J., a soldering iron with ⅛ or ¼-inch tip in 40, 50 or 60 watts for fine instrument soldering.

33. Reltool Corp., Milwaukee, a spiral center drill and countersink, with a 22 degree spiral which results in a shearing cutting action and which cuts a smoother hole. All flutes are ground.

34. Westinghouse Electric Corp., Pittsburgh 30, primary distribution fuses capable of carrying lightning surges and temporary heavy loads with transformer thermal capacities.

35. All-State Welding Alloys Co. Inc., 96 W. Post Rd., White Plains, N. Y., a 105,000 pounds per square inch shear strength silver solder with melting temperature of 1076° F. No. 111 solder offered in wire, strip and rings.

36. National Research Corp., Cambridge 42, Mass., all metal 3-stage oil diffusion pump. This H-16 pump has a capacity of 8500 cubic feet per minute at 0.1 microns. Heat input is 2250 watts.

37. Eutectic Welding Alloys Corp., 40 Worth St., New York 13, two new steel electrodes, EutecTrodes 66 AC and 660 DC, for arc welding steel at low base metal heat. Both are flux coated.

38. Schmidgall Products, 307 Cass St., Peoria 2, Ill., the Kant-Mar aluminum tipped hammer with hickory handle. Made in two sizes, it it offered with and without replaceable tips.

39. Wire & Cable Division, Wind Turbine Co., West Chester, Pa., wire rope safety slings and cables with a neoprene synthetic rubber coating for protection against weather, abrasion, corrosive liquids, etc.

40. Aircraft-Marine Products Inc., 1597 N. 4th St., Harrisburg, Pa., the Solistrand solderless wire connector for mechanically fastening solid or stranded wires and cables of small diameter.

41. Sarco Co. Inc., 475 Fifth Ave., New York 17, a cast steel thermostatic steam trap with helical bellows which will withstand the shock of external explosions. Pressures may be up to 300 pounds per square inch. tered.

42. Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y., an Airco 28 bronze welding rod for building up wear resistant surfaces subject to heavy loads, especially where high temperatures are encoun-

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Steel Supply Stringency Tightest Since War's End

Demand for major products far in excess of supply despite booming steel mill operations. Little prospect for relief over fall and winter months. Raw material shortages, furnace shutdowns for repairs may force some production curtailment. Scrap price strength in East spreading to other districts

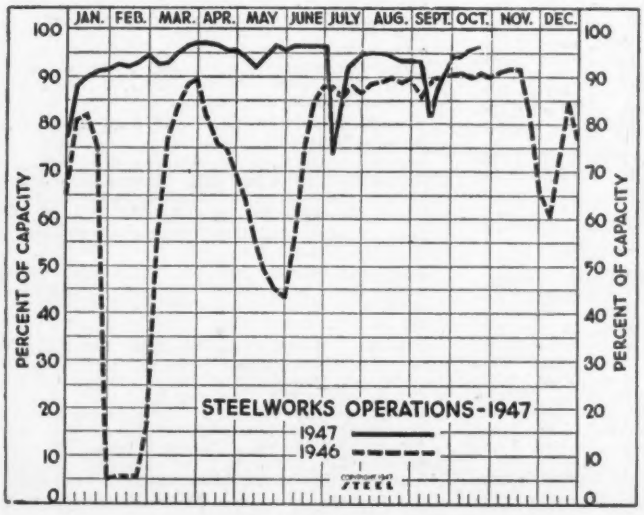
STRINGENCY in steel supply appears greater than at any time since the war's end. Despite booming steel mill operations demand for major products continues unsatisfied, and the outlook for early improvement is clouded by shrinking raw material inventories and necessary furnace shutdowns for repairs which are likely to force some curtailment in production over coming months.

Steelmaking operations are close to record peacetime levels in some districts. Producers, however, are handicapped by shortages of scrap, pig iron and coke, and indications are raw material inventories will shrink further before any improvement sets in.

Flat-rolled steel demand far exceeds supply in all grades, except in stainless and certain other specialites. So great is the shortage of flat-rolled consumers are reported entering the so-called "gray" market in increasing number for tonnage to support manufacturing schedules. Some fantastic prices are being paid for sheets in this market. Shutdowns of automotive and other manufacturing plants from time to time for lack of steel continue.

Clarification of the recent emergency freight rate increase has resulted in general marking up of delivered steel prices. Warehouses are passing the higher delivered prices along to customers. Mill base prices are not likely to be affected immediately.

While mill base prices are holding at levels established about Aug. 1 a strong undertone prevails in the market. With scrap showing new strength and raw material prices in general rising it would seem only a question of time when the inflationary pressures would force another upturn in steel prices generally. It is believed, however, the steelmakers will hold off another general advance as long as possible. At the moment high prices are being paid in the open market for semifinished steel. Carbon steel ingots, for instance, are reported moving in substantial tonnages at $80 to $85 per ton and this range may be pushed higher if scrap continues to rise further since some sellers of ingots in the open market tie their selling prices to scrap. Sheet bars are reported selling as high as $92 per ton in the open market.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Oct. 18	Change	Same Week 1946	Same Week 1945
Pittsburgh	104	+ 1.5	97.5	49
Chicago	95	None	90	75
Eastern Pa.	91.5	None	78	71
Youngstown	92	None	91	47
Wheeling	93.5	None	89	84
Cleveland	92	— 0.5	89.5	76
Buffalo	88.5	None	90.5	60.5
Birmingham	99	None	99	95
New England	84	None	90	79
Cincinnati	94	+ 7	84	71
St. Louis	80	None	51	68
Detroit	88	None	79	84
Estimated national rate	96	+ 0.5	90.5	65

Based on weekly steelmaking capacity of 1,749,928 net tons for 1947; 1,762,381 net tons for 1946; 1,831,636 tons for 1945.

Steelmaking operations continued to rise last week, the national ingot rate advancing ½ point to 96 per cent. This is the highest level attained since last June and it is only one point under the postwar peak. Operations gained 1½ points to 104 per cent in Pittsburgh and 7 points to 94 per cent of capacity in Cincinnati. The only district reporting a decline was Cleveland, off 1/2 point to 92 per cent.

For the third consecutive week, STEEL's composite market average on steelmaking scrap advanced, rising $1 to $39.75. This brought the average to the highest level since early August. Other composites held unchanged at $75.41 for finished steel, $56.80 for semifinished steel, and $36.13 for steelmaking pig iron.

New show of strength in the scrap market, first reported in STEEL a week ago, continues. Following an advance of $2 to $3 per ton on steelmaking grades in the East, strength has communicated to other districts though no broad markup of prices has yet been effected. At Pittsburgh heavy melting grades are quoted up to $43 per ton. This latter figure, however, prevails on tonnage brought into the district from remote points. Brokers are having difficulty in covering on old $38 contracts and it is reported that some mills are rewriting scrap contracts to higher levels.

COMPOSITE MARKET AVERAGES

	Oct. 18	Oct. 11	Oct. 4	One Month Ago Sept., 1947	Three Month Ago July, 1947	One Year Ago Oct., 1946	Five Years Ago Oct., 1942
Finished Steel	$75.41	$75.41	$75.41	$75.41	$70.80	$64.45	$56.73
Semifinished Steel	56.80	56.80	56.80	56.80	53.04	40.60	36.00
Steelmaking Pig Iron	36.13	36.13	36.13	36.14	33.82	27.50	23.00
Steelmaking Scrap	39.75	38.75	37.92	37.83	37.23	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. **Semifinished Steel Composite:**—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. **Steelmaking Pig Iron Composite:**—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. **Steelworks Scrap Composite:**—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Materials

	Oct. 18, 1947	Sept., 1947	July, 1947	Oct. 1946
Steel bars, Pittsburgh	2.90c	2.90c	2.66c	2.50c
Steel bars, del. Philadelphia	3.318	3.28	2.98	2.86
Steel bars, Chicago	2.90	2.90	2.66	2.50
Shapes, Pittsburgh	2.80	2.80	2.56	2.35
Shapes, del Philadelphia	2.954	2.94	2.64	2.48
Shapes, Chicago	2.80	2.80	2.56	2.35
Plates, Pittsburgh	2.95	2.95	2.71	2.50
Plates, del Philadelphia	3.17	3.15	2.85	2.558
Plates, Chicago	2.95	2.95	2.71	2.50
Sheets, hot-rolled, Pittsburgh	2.80	2.80	2.56	2.425
Sheets, cold-rolled, Pittsburgh	3.55	3.55	3.27	3.275
Sheets, No. 10 galv., Pittsburgh	3.90	3.90	3.63	†4.05
Sheets, hot-rolled, Gary	2.80	2.80	2.56	2.425
Sheets, cold-rolled, Gary	3.55	3.55	3.27	3.275
Sheets, No. 10 galv., Gary	3.90	3.90	3.63	†4.05
Strip, hot-rolled, Pittsburgh	2.80	2.80	2.56	2.45
Strip, cold-rolled, Pittsburgh	3.55	3.55	3.27	3.05
Bright basic, bess. wire, Pittsburgh	3.675	3.675	3.475	3.05
Wire nails, Pittsburgh	4.25	4.25	3.975	3.75
Tin plate, per base box, Pittsburgh	$5.75	$5.75	$5.75	*$5.25

* Nominal. † Base, No. 24 gage.

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$53.20	$38.00
Slabs, Pittsburgh, Chicago	47.50	47.50	43.60	39.00
Rerolling billets, Pittsburgh	47.50	47.50	43.60	39.00
Wire rod $\frac{5}{16}$ to $\frac{1}{4}$-inch, Pitts.	2.925c	2.925c	2.63c	‡2.30c

‡ Base, No. 5 to $\frac{5}{16}$-in.

Pig Iron

	Oct. 18, 1947	Sept., 1947	July, 1947	Oct. 1946
Bessemer, del. Pittsburgh	$37.91	$37.83	$36.03	$29.77
Basic, Valley	36.00	36.00	34.20	28.00
Basic, eastern del. Philadelphia	38.84	38.72	36.47	29.93
No. 2 fdry., del. Pgh. N. & S. sides	37.41	37.33	35.53	29.27
No. 2 fdry., del. Philadelphia	39.34	39.22	36.97	30.43
No. 2 foundry, Chicago	36.00	36.00	34.20	28.50
No. 2 foundry, Valley	36.50	36.50	34.70	28.50
Southern No. 2, Birmingham	34.88	34.88	31.98	24.88
Southern, No. 2, del. Cincinnati	38.74	39.75	36.85	28.94
Malleable, Valley	36.50	36.50	34.70	28.50
Malleable, Chicago	36.50	36.50	34.70	28.50
Charcoal, low phos., fob Lyles, Tenn.	44.00	44.00	43.00	33.00
Ferromanganese, fob cars, Pittsburgh	151.00	140.25	140.25	140.00

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.50	$38.00	$37.20	$20.00
Heavy melt. steel, No. 2, E. Pa.	40.00	36.75	38.06	18.75
Heavy melt. steel, No. 1, Chicago	38.75	38.75	35.95	18.75
Heavy melt. steel, No. 1, Valley	40.50	39.50	37.35	20.00
Heavy melt. steel, No. 1, Cleveland	38.25	38.25	37.65	19.50
Heavy melt. steel, No. 1, Buffalo	39.50	39.00	37.90	19.25
Rails for rerolling, Chicago	51.50	46.25	43.20	22.25
No. 1 cast, Chicago	47.50	43.50	41.10	25.00

Coke

Connellsville, beehive furnace	$12.25	$12.00	$11.20	$8.75
Connellsville, beehive foundry	14.50	14.50	13.05	9.50
Chicago, oven foundry, del.	18.60	18.50	17.46	15.10

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $80-$85. Forging quality $46, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $45-$50, sales by smaller interests on negotiated basis at $65 or higher.

Forging Quality, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $55-$58; Detroit, del., $61; eastern Mich., $62.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66, del. Detroit $69, eastern Mich., $70.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $60; sales in open market up to $92.

Skelp: Pittsburgh, Sparrows Point, Youngstown, Coatesville, 2.60c-2.65c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69.

Wire Rods: Pittsburgh, Chicago, Birmingham, $\frac{5}{16}$ to $\frac{1}{4}$-in., inclusive $2.80-3.05 per 100 lb. Galveston base, $2.95. Worcester, 2.90c. San Francisco (base del.), $3.52.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, Duluth, base, 20 tons one size, 2.90c; Detroit, del., 3.05c; eastern Mich., 3.10c; New York, del., 3.31c; Phila., del., 3.318c; San Francisco (base, del), 3.63-3.95c; Los Angeles (base, del.) 3.625-3.83c; Seattle, 3.85c, base.

Rail Steel Bars: Same basing points as merchant carbon bars, except base is 10 tons. Prices upon application.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.30c; Detroit, del., 3.45c; eastern Mich., 3.50c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.55c; Detroit, del., 3.70c; Toledo, 3.75c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 4.10c; Detroit, del., 4.25c; eastern Mich., 4.30c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.75c; San Francisco (base, del.), 3.33c; Los Angeles (base, del), 3.325c; Seattle, 3.88c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo. Prices upon application.

Iron Bars: Single refined, Pittsburgh 7.15c-†7.70c; double refined, 8.00-†9.75c; Pittsburgh, staybolt, 8.85c-†11.25c.

† Hand puddled.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Ashland, Ky., base, 2.80c; Granite City, 3.175c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; Philadelphia, del., 3.02c; New York, del., 3.12c; Los Angeles (base, del.), 3.54c; San Francisco, (base, del.), 3.545c. (Andrews Steel Co. quotes Middletown, O., base for shipment to Detroit. Alan Wood Steel Co., Conshohocken, Pa., quotes 3.40c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.55c; Granite City, 3.65c; Detroit, del., 3.70c; eastern Mich., del., 3.75c; New York, del., 3.96c; Philadelphia, del., 3.968c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, 3.85c-3.95c; Youngstown, Sparrows Point, Canton, Middletown, base, 3.95c; Granite City, 4.05c; New York, del., 4.27c; Philadelphia, del., 4.17c; Los Angeles (base, del.), 4.62c; San Francisco (base, del.), 4.625c.

Corrugated Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham base, 3.95c-4.05c.

Culvert Sheets, No. 16 flat: (Based on 5 cent zinc; corrugated 10 cents extra) Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.45c-4.55c; copper-iron or pure iron, 4.80c-4.90c. Granite City 4.65c and 5.00c, respectively. Los Angeles (base, del.), 5.24c; San Francisco (base, del.) 5.245c.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Stainless-Clad 20%: Pittsburgh, Washington, Coatesville, Pa., No. 304, 22.00c; No. 410, 20.00c; No. 430, 20.50c; No. 446, 27.00c. Prices include annealing and pickling.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 3.85c-4.05c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 3.90c-3.95c; Granite City, 4.05c; Detroit, del., 4.10c; eastern Mich., 4.15c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, Chicago, Gary, 4.80c; Granite City, Ill., Kokomo, Ind., 4.90c. Electrical: Pittsburgh, Chicago, Gary, 5.30c; Granite City, Kokomo, 5.40c. Motor: Pittsburgh, Chicago, Gary, 6.05c; Granite City, 6.15c. Dynamo: Pittsburgh, 6.75c; Granite City, 6.85c. Transformer 72, 7.25c; 65, 7.95c; 58, 8.65c; 52, 9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.80c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; San Francisco (base, del.), 3.605c; Los Angeles (base, del.), 3.60c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.55c; Chicago, base, 3.65c; Detroit, del. 3.70c; eastern Mich., 3.75c; Worcester, base, 3.75c-4.10c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 5.05c, over 0.60 to 0.80, 5.65c; over 0.80 to 1.05, 7.15c; over 1.05 to 1.35, 9.45c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, $5.75; Granite City, Birmingham, Sparrows Point, $5.85.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, $4.85; 0.50 lb tin, $5.05; 0.75 lb tin, $5.25; Granite City, Birmingham, Sparrows Point, $4.95, $5.15, $5.35, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.90c; Granite City, Birmingham, Sparrows Point, 4.00c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-lb base box $4.90; Granite City, Birmingham, Sparrows Point, $5.00.

Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $14.10.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.95c; Coatesville, Claymont, 3.15c; Geneva, Utah, (base, del.), 3.125c; New York, del. 3.27c; Phila., del., 3.17c; St. Louis, del., 2.77c; Boston, del. 3.423c; San Francisco and Los Angeles, del., 3.59c for sizes and grades produced at Geneva, 3.76c for sizes and grades produced at Fontana, Calif.

(Central Iron & Steel Co., Harrisburg, Pa., 4.15c, basing points.)

Floor Plates: Pittsburgh, Chicago, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.80c-4.137c; Coatesville, 4.50c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c.

Pittsburgh, Washington, Coatesville, Pa., 20% stainless-clad, base prices including annealing and pickling: No. 304, 24.00c; No. 410, 22.00c; No. 430, 22.50c; No. 446, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.80c; New York, del., 3.02c; Phila., del., 2.954c; Geneva, Utah (base, del.), 2.975c; Los Angeles (base, del.), 3.41c-3.47c for sizes produced at Torrance, Calif., beyond sizes at Geneva; Los Angeles and San Francisco, del., 3.44c for sizes produced at Geneva; San Francisco, del., 3.41c for sizes produced at Fontana, Calif.

Alloy Structural Shapes: Pittsburgh, Chicago, 3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

Wire to Manufacturers in carloads

Bright, basic or bessemer	*$3.55-3.80
Spring (except Birmingham)	**$4.25-**4.50

Wire Products to Trade

Nails

Standard and cement-coated	†$4.25
Galvanized	‡$4.00
Staples, polished and galvanized	$4.25

Wire, Merchant Quality

Annealed (6 to 8 base)	§$4.20
Galvanized (6 to 8 base)	§$4.65

(Fob Pittsburgh, Chicago, Birmingham, per base column)

Woven fence, 15 gage and heavier	††91
Barbed wire, 80-rod spool	††101
Barbless wire, twisted	101
Fence posts (no clamps)	††90
Bale ties, single loop	††91

* Worcester, $3.65, Duluth, $3.60, base. San Francisco (base, del) $4.56 for bright basic only.

** Worcester $4.60, Duluth and Trenton, N. J., $4.75, base. San Francisco (base, del.) $5.63 for MB spring wire; $5.28 black premier.

† Worcester $4.55, Cleveland $4.35, base. San Francisco (base, del.) $5.33.

‡ Duluth $4.00, Cleveland $4.10, base. San Francisco (base, del) $5.08.

§ Worcester $4.30, annealed; $4.75, galvanized. Duluth $4.20, annealed; $4.65, galvanized. San Francisco (base, del.) $5.21, annealed; $5.66, galvanized.

†† San Francisco (base, del.): Woven fence, 114; barbed wire, 121; bale ties, 115. Duluth (base): Woven fence, 91; barbed wire, 101; fence posts 90.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.10 per 100 lb; light rails (rail steel), Williamsport, Pa., Pittsburgh prices upon application.

Relaying, 60 lb and over fob warehouse $55-$56 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates, $3.05 per 100 lb, fob mill; $3.40 base, Seattle; $3.20, base, Pittsburg, Calif. Splice bars, $3.25 per 100 lb, fob mill. Standard spikes, 4.00c-4.50c; screw spikes, 5.80c-6.40c. Axles, 4.10c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	46	19½	1	56	41½
¼	47	25	1¼	56½	42
⅜	44	22	1½	57	42½
½	50½	34½	2	57½	43
¾	53½	38½	2½ & 3	58	43½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	49	34	48½	33½	48	33
2½-3	52	37	51½	36½	51	36
3½-6	54	39	53½	38½	53	38

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	In.	Butt Weld
⅛	45	1	55
¼	46	1¼	55½
⅜	43	1½	56
½	49½	2	56½
¾	52½	2½ & 3	57

In.	Lap Weld	Elec. Weld	Seamless
2	48	47½	47
2½ & 3	51	50½	50
3½-6	53	52½	52
8	53½	53	52½
10	53	52½	52
12	52	51½	51

Boiler Tubes: Net base prices per 100 ft, fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

		——Seamless——		—Elec. Weld—	
O.D.		Hot	Cold	Hot	Cold
Sizes	B.W.G.	Rolled	Drawn	Rolled	Drawn
1"	13	....	$11.87	$11.51	$11.51
1¼"	13	....	14.06	11.48	13.64
1½"	13	$13.08	15.69	12.69	15.22
1¾"	13	14.88	17.85	14.43	17.31
2"	13	16.67	19.99	16.17	19.39
2¼"	13	18.58	22.29	18.02	21.62
2¼"	12	20.47	24.54	19.86	23 80
2½"	12	22.42	26.87	21.75	26 06
2¾"	12	23.76	28.48	23.05	27.63
3"	12	24.93	29.90	24.18	29.00
3¼"	11	29.03	34.81	28.16	33.77
3½"	11	31.17	37.39	30.23	36.27
4"	10	38.69	46.38	37.53	44.99
4½"	9	51.28	61.50	....	....
5"	9	59.39	71.18	....	....
6"	7	91.13	109.27	....	....

Pipe, Cast Iron: Class B, 6-in. and over $74.50 per net ton, Birmingham; $79.50, Burlington, N. J.; $86.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅞ and ⅝ x 6-in. and shorter	46 off
¾-in. and larger x 6-in. and shorter	43 off
All diameters longer than 6-in.	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts	
All diameters 6 in. and shorter	46 off
All diameters longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

Nuts

Semifinished hexagon	A.S.E. Light	A.S.E. Reg. and Heavy
⅞-in. and smaller	46 off	.....
½-in. and smaller	.....	44 off
⅛-in.-1-in.	44 off	.....
⅛-in.-1-in.	.....	43 off
1⅛-in.-1½-in.	42 off	41 off
1¾-in. and larger	.....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws
(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	48 off
¾, ⅞, & 1 x 6 and shorter	44 off

Square Head Set Screws

Upset 1-in. and smaller	57 off
Headless, ¼-in. and larger	40 off
No. 10 and smaller	52 off

Rivets

Fob Pittsburgh, Cleveland, Chicago Birmingham

Structural ½-in. and larger	5.65c
Lebanon, Pa.	5.80c
⅞-in. and under	55 off
Lebanon, Pa.	55 off plus 15c per cwt

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1-$2 off

Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base, Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
	Base, Cents per lb				
CHROMIUM NICKEL STEELS					
301	26.00c	29.50c	37.00c	22.00c	28.00c
302	26.00	29.50	37.00	23.50	30.50
303	28.50	31.50	39.00	29.50	36.00
304	27.50	31.50	38.00	25.50	32.50
308	31.50	37.00	44.50	31.00	38.00
309	39.00	43.50	51.00	40.50	51.00
310	53.50	56.50	57.50	53.00	61.00
316	43.50	48.00	52.00	43.50	52.00
321	31.50	37.00	44.50	32.00	41.50
347	36.00	41.50	49.00	36.00	45.50
431	21.00	24.00	31.50	19.00	24.50
440A	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
403	23.50	27.00	32.00	23.00	29.50
410	20.50	23.50	29.00	18.50	24.00
416	21.00	24.00	29.50	20.00	25.50
420	26.00	31.00	36.50	26.00	39.50
430	21.00	24.00	31.50	19.00	24.50
430F	21.50	24.50	32.00	20.50	27.00
442	24.50	28.00	35.50	26.00	35.00
443	24.50	28.00	35.50	26.00	35.00
446	30.00	33.00	39.50	38.00	56.50
*501	9.00	13.00	17.50	13.00	18.50
*502	10.00	14.50	18.50	14.50	19.50
†STAINLESS CLAD STEEL (20%)					
304	....	24.00	22.00	....	....
410	....	22.00	20.00	....	....
430	....	22.50	20.50	....	....
446	....	29.00	27.00	....	....

* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., base	$37.00	$37.50	$38.00	$38.50
Newark, N. J., del.	39.02	39.52	40.02	40.52
Brooklyn, N. Y., del.	....	40.80	44.30	....
Philadelphia, del.	38.84	39.34	39.84	40.34
Birdsboro, Pa., base	40.00	40.50	41.00	41.50
Birmingham, base	32.88*	33.38*	....	....
Baltimore, del.	....	40.42	....	....
Chicago, del.	....	37.12	....	....
Cincinnati, del.	....	38.74	....	....
Newark, N. J., del.	....	39.14	....	....
Philadelphia, del.	....	38.96	....	....
St. Louis, del.	....	37.77	....	....
Buffalo, base	36.00*	36.00*	36.50*	37.00
Boston, del.	43.13	43.13	43.63	44.13
Rochester, del.	38.02	38.02	38.52	39.02
Syracuse, del.	38.75	38.75	39.25	39.75
Canton, Massillon, O., base	35.50	36.00	36.50	....
Chicago, base	35.50	36.00	36.50	37.00
Milwaukee, del.	36.95	37.45	37.95	38.45
Muskegon, Mich., del.	....	40.21	40.71	....
Cleveland, fob furnace	35.50*	36.00*	36.50*	37.00
Akron, del.	37.34	37.84	38.34	38.84
Duluth, base	36.00	36.50	37.00	37.50
Erie, Pa., base	35.50	36.00	36.50	37.00
Everett, Mass., base	....	45.00	45.50	....
Granite City, Ill., base	36.50	37.00	....	....
St. Louis, del.	37.33	37.83	....	....
†**Neville Island, Pa.,** base	36.00	36.50	36.50	37.00
Pittsburgh, del., N.&S. Sides	36.91	37.41	37.41	37.91
Provo, Utah, base	36.00	36.50	....	....
Seattle, Tacoma, Wash., del.	....	43.03	....	....
Portland, Oreg., del.	....	43.03	....	....
Sharpsville, Pa., base	36.00	36.50	36.50	37.00
Steelton, Pa., base	37.00	37.50	38.00	38.50
Struthers, O., base	36.50	37.00	37.00	37.50
Swedeland, Pa., base	41.00	41.50	42.00	42.50
Troy, N. Y., base	37.50	38.00	38.50	39.00
Toledo, O., base	35.50	36.00	36.50	37.00
Cincinnati, del.	39.35	39.85	....	....
Youngstown, O., base	36.00	36.50	36.50	37.00
Mansfield, O., del.	39.28	39.78	39.78	40.28

† To Neville Island base add: 73c for McKees Rocks, Pa., $1.11 Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; $1.46 Oakmont, Verona; $1.64 Brackenridge.

* Republic Steel Corp., quotes $3 a ton higher at Birmingham, effective Aug. 13; $2.00 higher at Buffalo for No. 2 foundry and malleable and $1.50 higher for basic and $2.75 higher at Cleveland, effective on shipments during week ended Oct. 19.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base) ...$45.50
6.51-7.00..$46.75 9.01- 9.50. 53.00
7.01-7.50.. 48.00 9.51-10.00. 54.25
7.51-8.00.. 49.25 10.01-10.50. 55.50
8.01-8.50.. 50.50 10.51-11.00. 56.75
8.51-9.00.. 51.75 11.01-11.50. 58.00

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron: Si 14.01-14.50%, $70.75, Jackson, O.; $73.75, Niagara Falls; $75, piglets, $73, open-hearth and foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn....$44.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $36.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $42.00; Birdsboro, Pa., $45 base; Philadelphia, $44.38, del. Intermediate phosphorus, Central furnace, Cleveland, $39.00.

Differentials

Basng point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$12.00-$12.50
Connellsville, foundry	14.00- 15.00
New River, foundry	12.50
Wise county, foundry	11.15
Wise county, furnace	10.65

Oven Foundry Coke

Kearney, N. J., ovens	$17.85
Chicago, outside del.	17.60
Chicago, del.	18.60
Terre Haute, del.	18.15
Milwaukee, ovens	18.25
New England, del.	19.60
Birmingham, del.	15.10
Indianapolis, ovens	17.00
Cincinnati, del.	16.60
Ironton, O., ovens	15.50
Painesville, ovens	16.60
Cleveland, del.	18.00
Buffalo, del.	18.35
Detroit, del.	17.75
Philadelphia, ovens	16.90
Swedeland, Pa., ovens	16.90
Portsmouth, O., ovens	16.00
Fairmont, W. Va., ovens	15.75
Pittsburgh, del.	17.71

Coal Chemicals

Spot, gal. freight allowed east of Omaha. Effective as of Apr. 1, 1947.

Pure and 90% benzol	19.00c
Toluol, two degrees	23.00c
Industrial xylol	23.00c
Solvent naphtha	26.00c

Per pound fob works

Phenol (car lots, returnable drums)	11.25c
Do., less than carlots	12.00c
Do., tank cars	10.25c

Eastern plants, per pound

Naphthalene flakes, balls, bbl, to jobbers, "house-hold use"	9.50c

Per ton, bulk, fob plants

Sulphate of ammonia	$30.00

Refractories

Per 1000, fob shipping point

Net Prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$87.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	70.00
Ala., Ga.	70.00
N. J.	75.00

Intermediate Heat Duty

Ohio	64.00
Pa., Ill., Md., Mo., Ky.	64.00
Ala., Ga.	56.00
N. J.	67.00

Low-Heat Duty

Pa., Md., Ohio	56.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press	47.00
Wire Cut	45.00

Malleable Bung Brick

All bases	80.00

Silica Brick

Pennsylvania	70.00
Joliet, E. Chicago	79.00
Birmingham, Ala.	70.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	59.00
Chem. bonded chrome	59.00
Magnesite brick	81.00
Chem. bonded magnesite	70.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	24.00
Single bags	28.00

Dolomite

Domestic, dead-burned, bulk, net ton, fob Billmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.05; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre, Mo.), add $0.20.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$5.95
Old range nonbessemer	5.80
Mesabi bessemer	5.70
Mesabi nonbessemer	5.50
High phosphorus	5.55

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.63% contract	15.25

Foreign Ore

Cents per unit, c/f Atlantic ports

No. African low phos.	Nom.
Swedish basic, 60 to 68%	13.50
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$32-$34

Manganese Ore

46.50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 63.00c-67.00c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$27-$27.50
45% no ratio	28.00
48% no ratio	30.00
50% no ratio	31.00
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
48% 3:1 lump	43.50
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo. cont., Mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheets, Hot-Rolled	4.30	4.30	4.30	4.30	4.30	4.30	...	...	...
Cold-Rolled	5.30	5.30	5.30	5.30	...	5.30	...	...	...
Galvanized	5.85	...	...	...	...	...	...	...	...
Strip, Hot-Rolled	4.30	4.30	4.30	4.30	...	...	...	...	...
Cold-Rolled	5.30	5.30*	5.30*	5.30	...	...	...	...	...
Shapes, Structural	4.30	4.30	...	4.30	...	...	4.30	...	...
Plates	4.55	4.55	4.55	...	4.55	...	...	...	...
Bars, Small Shapes	4.45	4.45	4.45	4.45	...	4.45	...	4.45	4.45

* Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras and to revision in line with 10 per cent increase in freight rates.

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. *10G	Gal. *24G	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½"& up	H-R Alloy (8140)	Structural Shapes	Carbon ⅜"-¾"	Floor ¾" & Thicker
Boston (city)	4.90	5.97[4]	5.67[4]	6.10[4]	7.35[4]	4.97	6.71	4.92	5.57	7.17	4.77	5.05	6.72
††New York (city)	4.87	6.07	5.77[3]	6.07	7.32	4.97	....	4.97	5.52	6.97[9]	4.72	5.02	6.70
New York (country)	4.72	5.92	5.62[3]	5.92	7.17	4.82	....	4.82	....	....	4.57	4.87	6.55
Philadelphia (city)	4.64	6.23[9]	5.83[9]	5.84	7.09	4.73	5.63	4.78	5.48	6.92[9]	4.52	4.79	6.13
Philadelphia (country)	4.54	6.13[9]	5.73[9]	....	....	4.63	5.53	4.68	....	6.82[9]	4.42	4.69	6.08
Baltimore (city)	4.29†	5.85	5.55	5.54	6.79	4.70	....	4.75	5.45	....	4.64	4.74	6.20
Baltimore (country)	4.19†	5.75	5.45	5.35	6.60	4.60	....	4.65	....	....	4.54	4.64	6.10
Washington (city)	4.75	....	....	....	....	4.95	....	5.00	5.60[13]	....	4.90	4.95	6.60
Washington (country)	4.65	....	....	....	....	4.85	....	4.90	....	....	4.80	4.85	6.50
Norfolk, Va.	4.75	....	....	....	....	....	....	5.05	5.85	....	5.00	5.00	6.75
Memphis, Tenn. (city)	4.77[20]§§	5.79[20]†	....	....	....	4.97[20]	....	4.92[20]	5.79	....	4.92[20]	5.12[20]	6.79[20]
Memphis, Tenn. (country)	4.67[20]§§	5.69[20]†	....	....	....	4.87[20]	....	4.82[20]	5.69	....	4.82[20]	5.02[20]	6.69[20]
Buffalo (city)	4.45	....	5.20[3]	5.95	....	4.65	5.60	4.40	5.10	8.15	4.40	4.85	6.20
Buffalo (country)	4.30	....	5.05[3]	5.50	....	4.20	5.45	4.25	4.95	8.15	4.25	4.40	5.75
Pittsburgh (city)	4.25§§	....	5.10[3]†	5.65	6.90	4.35	5.35	4.40	5.10	10.65	4.40	4.60	5.90
Pittsburgh (country)	4.15§§	....	4.90[3]†	5.50	6.75	4.20	5.20	4.25	4.95	10.50	4.25	4.45	5.75
Cleveland (city)	4.45	5.50[3]	5.20[3]	5.638	6.888	4.488	5.35	4.40	5.10	6.908	4.613	4.55	6.111
Cleveland (country)	4.30	5.35[3]	5.05[3]	....	....	....	5.20	4.25	4.95	....	....	4.40	....
Cincinnati (city)	4.671	5.516[3]	....	5.716	6.466	4.694	....	4.703	5.353	....	4.744	4.903	6.244
Chicago (city)	4.45	5.50[3]	5.20[3]	5.65	6.90	4.35	5.35	4.40	5.10	6.65[13]	4.40	4.60	6.05
Chicago (country)	4.30	5.35[3]	5.05[3]	5.50	6.75	4.20	5.20	4.25	4.95	8.15	4.25	4.40	5.75
Milwaukee	4.599	5.649[3]	5.349[3]	5.799	7.049	4.499	5.599	4.549	5.249	6.949[9]	4.549	4.749	6.199
St. Louis	4.749	5.799[9]	5.499[3]	5.974	7.224	4.649	5.774	4.699	5.424[13]	7.124	4.699	4.899	6.349
Birmingham (city)	4.45[20]§§	....	....	5.80	....	4.45[20]	....	4.40[20]	5.93[23]	....	4.40	4.65	6.88
Birmingham (country)	4.30[20]§§	....	....	5.50	....	4.30[20]	....	4.25[20]	....	....	4.25	4.50	....
New Orleans	4.98[20]••	....	6.29[18]	....	....	5.18[20]	....	5.13[20]••	6.29[11]	....	5.03[20]••	5.33[20]	7.29[20]
Omaha, Nebr.	5.068	....	....	6.468	7.718	5.168	....	5.218	5.918	....	5.218	5.418	6.868
Seattle, Tacoma, Wash.	5.30[17]	....	7.10[3]	6.70	....	5.60[17]	....	5.30[17]	7.45[10]	8.50[13]	5.25[17]	5.45	7.55[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—any quantity; [2]—300 to 1999 lb; [5]—150 to 2249 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—one bundle to 1499 lb; [7]—one to nine bundles; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [10]—450 to 39,999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [13]—400 to 14,999 lb; [14]—400 to 39,999; [15]—2000 lb and over; [16]—1000 to 4999 lb; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

* Include gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § as rolled, except Indianapolis, Los Angeles, San Francisco, and Pittsburgh where price represents annealed bars; •• add 0.46 for sizes not rolled in Birmingham; †† same prices quoted for Jersey City, N. J.; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si.) Carlot per gross ton, $47, Palmerton, Pa., $51, Pittsburgh. 16% to 19% Mn., $46, Palmerton, $50, Pittsburgh.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $153, ton lot $165, less ton $172; fob New Orleans, Mobile, Philadelphia, Baltimore, or New York. Carload, lump, bulk $151, fob cars Pittsburgh, including 50c switching charge. Add, or subtract, $1.85 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%.

West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $23.83 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Ferromanganese-Silicon Mix: (Mn 20-25%, Si 47-54%, Fe 25-30%, C 6% max.). Eastern Zone, contract, carload, packed, 20 M x D, 14.25c per lb of alloy, ton lot 15c, less ton 16c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.6c for l.c.l. Freight allowed.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17c, ton lot 17.6c, less ton 18.2c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.4c per lb of alloy, carload packed, 7.95c, ton lot 8.45c, less ton 8.95c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 17.6c per lb of contained Cr, c.l., packed 18.2c, ton lot 18.8c, less ton 19.5c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Special Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, carload, 8MxD, bulk 19.1c per lb of contained Cr, carload, packed 19.7c, ton lot 20.4c, less ton 21.35c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 27c per lb of contained Cr, 0.04% C 26c, 0.05% C 25.5c, 0.06% C 25c, 0.10% C 24.5c, 0.15% C 24.0c, 0.20% C 23.75c, 0.15% C 23.5c, 1% C 23.0c, 2% C 22.5c. Carload packed add 0.8c, ton lot add 1.35c, less ton add 2.35c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, and C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 23c per lb of contained chromium, carload, packed 23.8c, ton lot 24.35c, less ton 25.35c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe.). Eastern Zone, contract, carload, 1" x D, bulk, max. 0.50% C grade, 0.87c per lb of contained chromium, carload packed 0.88c, ton lot 89.5c, less ton 91.5c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 8.8c per lb of contained Si, carload packed 10c, ton lot 10.65c, less ton 11.3c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.). Add 1.3c to 50% Ferrosilicon prices.

Low-Aluminum 65% Ferrosilicon: (Al 0.50% max.). Eastern Zone, contract, lump bulk 11.55c per lb of contained Si, carload packed 12.6c, ton lot 13.2c, less ton 13.8c; Central, add 0.45c for c.l. and 0.9c for l.c.l.; Western, add 1.4c for c.l. and 5.75c for l.c.l. Freight allowed. Spot, add 0.35c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 12.7c per lb of contained Si, carload packed 13.7c, ton lot 14.25c, less ton 14.8c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% Ferrosilicon prices.

90-95% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 14.35c per lb of contained Si, carload packed 15.35c, ton lot 15.85c, less ton 16.35c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.65c to above 90-95% Ferrosilicon prices.

15% Ferrosilicon, Ground Form: (15.01-15.5% Si) Contract or spot, c.l., packed, 65 M x D or 100 M x D, $114 per gross ton of alloy, fob Niagara Falls, N. Y.; 48 and 65 M x D, $111, and 100 M x D, $115, fob Keokuk, Iowa. (15.51-16% Si) Add $1 per gross ton.

Silicon Metal: (Over 97% Si and 1% max. Fe). Eastern Zone, c.l., lump, bulk, regular, 16.5c per lb of Si, c.l. packed 17.5c, ton lot 18c, less ton 18.5c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade, analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract basis fob Niagara Falls, N. Y., lump per lb c.l. 6.50c; ton lots packed, 7c; 200 to 1999 lb, 7.75c; smaller lots, 8.25c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 11.1c per lb of briquet, carload packed 11.6c, ton lot 12c, less ton 12.4c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8c per lb of briquet, c.l. packed, 8.6c, ton lot 9c, less ton 9.4c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l., bulk 9.65c per lb of briquet, c.l. packed 10.25c, ton lot 10.65c, less ton 11.05c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l., freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 4.65c per lb of briquet, c.l. packed 5.25c, ton lot 5.65c, less ton 6.05c. (**Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 4.8c, c.l. packed 5.4c, ton lot 5.8c, less ton 6.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 16.75c per lb of alloy, carload packed 17.35c, ton lot 18.85c, less ton 19.85c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 15.5c per lb of alloy, carload packed 16.5c, ton lot 18c, less ton 19c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.50 per lb of contained W; 2000 lb W to 10,000 lb W, $2.60; less than 2000 lb W, $2.72. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $3.05 per lb of contained W; less than 1000 lb W, $3.15.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.55c, ton lot 6.9c, less ton 7.25c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.4c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western, add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone, contract, ton lots, 1" x D, $1.20 per lb of alloy, freight allowed. Less ton lots $1.30; Central, add 0.75c; Western, add 2.9c; Spot add 5c.

Borosil: (3 to 4% B, 40 to 45% Si). $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, bulk 15.75c per lb of material, carload packed 16.5c, ton lot 17.25c, less ton 18c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 37c per lb of alloy, ton lot 39c, less ton 41c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 14.3c per lb of alloy, ton lot 15.05c, less ton 15.8c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus: (17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Stocks of Nonferrous Metals Increasing

Latest statistics covering copper and zinc show further improvement in supplies

NEW YORK — Additional statistics were released last week, showing that supplies of nonferrous metals are increasing steadily and that the shortages have been corrected in several of the markets.

COPPER — A broader picture of the statistical position of copper is being made available by the Copper Institute, starting with the September report. This report, while still incomplete, covers not only the United States, but also Canada, South America, Mexico, Africa and Spain. On the basis of the enlarged world statistics, the reporting nations showed a total of 170,301 tons of refined copper delivered to consumers during September against 159,048 tons in August, a gain of 11,253 tons. Production of crude copper for these countries totaled 178,740 tons last month compared with 161,552 tons in August. Secondary production of custom smelters totaled 10,961 tons in September against 8424 tons in August; output of refined copper, 180,970 tons against 161,725. Total stocks of refined copper for reporting nations were placed at 225,694 tons at the end of September against 216,477 tons at the end of August. World stocks of blister copper increased 8731 tons during September.

In the United States, consumption of copper in September totaled 95,582 tons, the low point for any month this year. The total was 722 tons below August deliveries of 96,304 tons, the previous low for the year. Total production of primary copper in the United States was 73,811 tons in September against 75,722 tons in August. Custom smelter production of copper from secondary materials was placed at 9973 tons last month against 7585 tons in August. On a combined basis, the total production of copper from primary and custom smelter secondary sources totaled 83,784 tons last month against 83,307 tons in August.

Refined copper production in the United States totaled 92,088 tons in September compared with 88,052 tons in August. Included in refined copper figures is metal derived from processing of foreign copper.

Stocks of refined copper held by producers in the United States totaled 80,113 tons at the end of September against 77,212 tons at the end of August.

The domestic market held firm last week at 21.50c, Connecticut Valley, for electrolytic while the foreign market was fairly active with some sales transacted on the equivalent basis of 21.37 1/2c, fas New York.

LEAD — U. S. Commercial Co., subsidiary of Reconstruction Finance Corp., received an average price of 13.036c for about 315 short tons of bulk lead scrap and 13.5022c for about 824 short tons of lead scrap in ingot form. This material had been obtained in Japan. Fairly active demand is reported for November delivery in the domestic pig lead market with prices steady at 14.80c to 14.85c, St. Louis.

ZINC — Based on unofficial reports from Washington, it is estimated that total production of zinc in the eastern states this year will total 162,000 tons, or about 17 per cent above the 1946 total. According to the Bureau of Mines, domestic consumption in the first five months of this year totaled 356,610 tons against 290,322 tons in the like 1946 period, or an increase of about 23 per cent. Prices in the domestic market continued steady last week at 10.50c, East St. Louis, for prime western.

TIN—Reconstruction Finance Corp. has purchased an additional 3800 tons of Straits tin against offerings submitted by the British Ministry of Supply, making a total of 28,505 tons of tin purchased this year and completing what the agency is entitled to buy this year against the allocations by the Combined Tin Committee. Prices here were firm last week on the basis of 80.00c for Straits.

SILVER — No new developments were noted in the silver market last week. Handy & Harman's official price held at 71.38 1/2c an ounce, a price which has prevailed since Sept. 23.

NONFERROUS METAL PRICES

Copper: Electrolytic, carlots 21.50c, delivered Conn.; Lake, 21.62½c del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c 1000-4999 lb; 1½c, 509-999 lb; 2c 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 17.50c-18.00c; 88-10-2 (No. 215) 25.75-26.25c; 80-10-10 (No. 305) 21.50-22.00c; No. 1 yellow (No. 405) 13.75-14.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

Zinc: Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 14.00-14.50c; No. 12 foundry alloy (No. 2 grade) 13.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 14.50c; grade 2 (92-95%) 12.75c; grade 3 (90-92%) 12.00-12.25c; grade 4 (85-90%) 11.50-11.75c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00c-56.00c; 25 to 99 lb, 42.00c-46.00c; 100 to 4000 lb, 35.00c-36.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl. 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99-99.49% incl. 78.90c; Grade F, below 99% (for tin content), 78.70c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 224-999 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35.00c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

Mercury: Open market, spot, New York, $81-$84 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $17 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 lb for 550 lb (keg) $1.67 lb for 100 lb (case); $1.72 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y., 71.37½c, per ounce.

Platinum: $59-$62 per ounce.

Palladium: $24 per troy ounce.

Iridium: $80-$90 per troy ounce.

Rolled, Drawn, Extruded Products

Copper and brass products prices based on 21.50c, Conn., for copper. Freight prepaid on 100 lb or more).

Sheet: Copper 33.68c; yellow brass 29.63c; commercial bronze, 95% 33.72c, 90% 33.11c, red brass, 85% 31.99c, 80% 31.38c; best quality 30.64c; Everdur, Duronze, Herculoy or equiv., cold-drawn, 38.46c; nickel silver, 18%, 42.49c; phosphor bronze, grade A, 5%, 52.00c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.39c; commercial bronze, 95% 33.41c, 90% 32.80c; red brass, 85% 31.68c, 80% 31.07c; best quality 30.33c.

Seamless Tubing: Copper 33.72c; yellow brass 32.39c; commercial bronze 90% 35.52c; red brass 85% 34.65c, 80% 34.04c; best quality brass 33.05c.

Wire: Yellow brass 29.92c; commercial bronze, 95% 34.01c, 90% 33.40c; red brass, 85% 32.28c, 80% 31.67c; best quality brass 30.93c.
Copper Wire: Bare, soft, fob eastern mills, carlots 26.92c, less carlots 27.42c; weatherproof, fob eastern mills carlots 27.60c, less carlots 28.10c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88c.

Aluminum Sheets and Circles: 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

B. & S. Gage	Max. Width or Diam.	Sheet Base	Circle Base
0.0249"-7	48"	23.70	26.20
8-10	48"	24.20	26.70
11-12	26"	24.70	27.50
13-14	26"	24.90	27.90
15-16	26"	25.10	28.20
17-18	26"	25.40	28.60
19-20	24"	25.70	29.00
21-22	24"	26.10	29.50
23-24	24"	26.60	30.20
25	24"	27.10	30.90
26	24"	27.80	31.90
27	24"	28.50	33.00
28	24"	29.20	33.70
29	24"	30.00	34.70
30	24"	30.80	35.80

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq ft; 75c, 10 to 20 sq ft and circles.
Pipe: Full coils 17.50c; cut coils 17.75c.
Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

Copper Carbonate: 52-54% metallic Cu, 50 lb bags, 26.50c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

Tin Anodes: Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 500 lb, 93.50c; less than 200 lb, 95.00c; ball, 1000 lb and over, 94.75c; 500 to 1000 lb, 95.25c; 200 to 500 lb, 95.75c; less than 200 lb, 97.25c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., price on application.

Sodium Stannate: To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.50c.
To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.
To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb, 45.50c; 1000 to 1999, 46.50c; 600 to 999 lb, 48.50c.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)
Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.125	14.875	14.250
Commercial Bronze			
95%	18.000	17.750	17.250
90%	17.500	17.250	16.750
Red brass			
85%	17.250	17.000	16.500
80%	16.875	16.625	16.125
Best Quality (71-79%)	16.125	15.875	15.375
Muntz Metal	14.125	13.875	13.375
Nickel silver, 5%	16.125	15.875	8.063
Phos. bronze, A, B	20.000	19.750	18.750
Naval brass	14.500	14.250	13.750
Manganese bronze	14.500	14.250	13.625

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 17.00, No. 2 copper 15.50-16.00, light copper 14.50-15.00, composition red brass 12.75-13.00, auto radiators 9.75, heavy yellow brass 9.00, brass pipe 10.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.00-18.25, No. 2 copper 16.50-16.75, light copper, 15.50-15.75, refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, 12.625.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.00, No. 2 15.00, light copper 14.00, No. 1 composition red brass 11.00, No. 1 composition turnings 10.00-10.50, mixed brass turnings 5.50-6.00, new brass clippings nom. 10.50-11.00, No. 1 brass rod turnings 9.00-9.50, light brass 5.00-5.50, heavy yellow brass 6.00-6.50, new brass rod ends 9.00-9.50, auto radiators, unsweated 8.50-9.00, cocks and faucets 8.00-8.25, brass pipe 8.00-8.25.

Lead: Heavy 11.50, battery plates 6.25-6.50, linotype and stereotype 12.25-12.50, electrotype 10.75-11.00, mixed babbitt 10.75-11.00, solder joints 15.50-16.00.

Zinc: Old zinc 5.00, new die cast scrap 3.50, old die cast scrap 2.00-2.50.

Tin: No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

Aluminum: Clippings, 2S 8.00-8.50, old sheets 6.00-6.50, crankcases 6.00-6.50, borings and turnings 2.00-2.50, pistons, free of struts, 5.00-5.50.

Nickel: Anodes 16.00-17.00, turnings 12.50-13.00, rod ends 16.00-17.00.

Monel: Clippings 12.00-12.50, turnings 7.00-7.25, old sheets 10.00-10.50, rods 10.00-10.50, castings 9.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$38.00-43.00*
No. 2 Heavy Melt. Steel	38.00-43.00*
No. 1 Busheling	38.00-43.00*
Nos. 1, 2 and 3 Bundles	38.00-43.00*
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	34.50-35.00
Short Shovel Turnings.	36.00-37.00
Cast Iron Borings	34.50-35.00
Bar Crops and Plate	45.50-46.00
Low Phos. Steel	45.50-46.00
Punchings & Plate Scrap	45.50-46.00
Cut Structurals	45.50-46.00
Elec. Furnace Bundles.	43.50-44.50
Heavy Turnings	36.50-37.50

* Local material is nominally $38; remote material is moving at $42 to $43, depending on the freight.

Cast Iron Grades

No. 1 Cupola	44.00-44.50
Charging Box Cast	40.00-40.50
Heavy Breakable Cast.	37.50-38.00
Stove Plate	37.00-38.00
Unstripped Motor Blocks	38.00-39.00
Malleable	52.00-53.00
Brake Shoes	35.00-36.00
Clean Auto Cast	40.00-41.00
No. 1 Wheels	44.00-45.00
Burnt Cast	32.00-33.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.50-42.00
R.R. Malleable	52.00-53.00
Axles	42.00-43.00
Rails, Rerolling	48.00-49.00
Rails, Random Lengths	46.00-47.00
Rails, 3 ft and under	47.50-48.00
Rails, 18 in. and under	49.00-49.50
Railroad Specialties	49.00-49.50
Uncut Tires	46.00-46.50
Angles, Splice Bars	47.50-48.00

CLEVELAND

No. 1 Heavy Melt. Steel	$38.00-38.50
No. 2 Heavy Melt. Steel	38.00-38.50
No. 1 Busheling	38.00-38.50
Nos. 1 & 2 Bundles	38.00-38.50
Machine Shop Turnings	33.00-33.50
Mixed Borings, Turnings	33.50-34.00
Short Shovel Turnings.	33.50-34.00
Cast Iron Borings	33.50-34.00
Bar Crops and Plate	41.00-41.50
Punchings & Plate Scrap	41.00-41.50
Heavy Turnings	37.00-37.50
Alloy Free Turnings	34.00-34.50
Cut Structurals	41.00-44.00

Cast Iron Grades

No. 1 Cupola	46.50-47.50
Charging Box Cast	43.50-44.50
Stove Plate	43.00-43.50
Heavy Breakable Cast.	41.00
Unstripped Motor Blocks	41.00
Malleable	57.00-60.00
Brake Shoes	42.00
Clean Auto Cast	48.00-50.00
No. 1 Wheels	44.00
Burnt Cast	41.00-41.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-41.50
R.R. Malleable	57.00-60.00
Rails, Rerolling	50.00
Rails, Random Lengths	46.00-47.00
Rails, 3 ft and under	48.00-50.00
Cast Steel	48.00-48.50
Railroad Specialties	48.00-48.50
Uncut Tires	48.00-48.50
Angles, Splice Bars	48.00-50.00

VALLEY

No. 1 Heavy Melt. Steel	$40.00-41.00
No. 2 Heavy Melt. Steel	39.00-40.00
No. 1 Bundles	39.00-40.00
Machine Shop Turnings	34.00-35.00
Short Shovel Turnings.	34.00-35.00
Cast Iron Borings	34.00-35.00
Low Phos.	44.00-45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.00

MANSFIELD

No. 1 Heavy Melt. Steel	$38.00-40.00
Machine Shop Turnings	35.00
Short Shovel Turnings.	36.00-37.00

CINCINNATI

No. 1 Heavy Melt. Steel	$38.00
No. 2 Heavy Melt. Steel	38.00
No. 1 Busheling	38.00
No. 1 Bundles	38.00
No. 2 Bundles	38.00
Machine Shop Turnings	32.00
Mixed Borings, Turnings	31.00
Short Shovel Turnings.	34.00
Cast Iron Borings	33.00

Cast Iron Grades

No. 1 Cupola Cast	48.00
Charging Box Cast	42.00
Heavy Breakable Cast.	41.00
Stove Plate	39.00
Unstripped Motor Blocks	39.00
Brake Shoes	36.00
Clean Auto Cast	47.00
Drop Broken Cast	51.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00
R.R. Malleable	58.00
Rails, Rerolling	47.00
Rails, Random Lengths	45.00
Rails, 18 in. and under	51.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	**$34.50-35.00**
No. 1 Busheling	**34.50-35.00**
Nos. 1 & 2 Bundles	**34.50-35.00**
No. 3 Bundles	**34.50-35.00**
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings.	29.50-30.00
Cast Iron Borings	29.50-30.00
Punchings & Plate Scrap	40.00-40.50

Cast Iron Grades

No. 1 Cupola Cast	42.00-43.00
Heavy Breakable Cast.	35.00-36.00
Clean Auto Cast	42.00-43.00

BUFFALO

No. 1 Heavy Melt. Steel	$39.00-40.00
No. 2 Heavy Melt. Steel	37.00-38.00
No. 1 Busheling	37.00-38.00
No. 1 & 2 Bundles	37.00-38.00
Machine Shop Turnings	31.50-32.50
Mixed Borings, Turnings	31.50-32.50
Cast Iron Borings	31.50-32.50
Short Shovel Turnings.	32.50-33.50
Low Phos	42.50-43.50
Elec. Furnace Bundles.	39.50-40.50

Cast Iron Grades

No. 1 Cupola Cast	40.00-41.00
Heavy Breakable Cast.	35.00-36.00
Malleable	52.00-55.00
No. 1 Wheels	41.00-42.00

Railroad Scrap

Rails, 3 ft and under	46.00-47.00
Railroad Specialties	47.00-48.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$40.00
No. 2 Heavy Melt. Steel	40.00
No. 1 Busheling	40.00
No. 1 Bundles	40.00
No. 2 Bundles	40.00
No. 3 Bundles	38.00
Machine Shop Turnings	32.00-33.00
Mixed Borings, Turnings	32.00-33.00
Short Shovel Turnings.	34.00-35.00
Bar Crop and Plate	44.50-45.00
Punchings & Plate Scrap	44.50-45.00
Cut Structurals	44.50-45.00
Elec. Furnace Bundles.	43.00-44.00
Heavy Turnings	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	46.00-48.50
No. 1 Machinery Cast.	49.00-51.00
Charging Box Cast	48.00
Heavy Breakable Cast.	48.00
Unstripped Motor Blocks	44.00-45.00
Malleable	58.00-60.00
Clean Auto Cast	49.00-51.00
No. 1 Wheels	48.00-49.00

NEW YORK

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.00
No. 2 Heavy Melt. Steel	34.00
No. 1 Busheling	34.00
Nos. 1 & 2 Bundles	34.00
No. 3 Bundles	33.00
Machine Shop Turnings	28.50
Mixed Borings, Turnings	28.50
Short Shovel Turnings.	30.00
Punchings & Plate Scrap	37.50
Cut Structurals	37.50
Elec. Furnace Bundles.	37.00

Cast Iron Grades

No. 1 Cupola Cast	41.00
Charging Box Cast	41.00
Heavy Breakable	41.00
Unstripped Motor Blocks	38.50
Malleable	54.00-55.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$32.00-33.00
No. 2 Heavy Melt. Steel	32.00-33.00
Nos. 1 & 2 Bundles	32.00-33.00
No. 1 Busheling	32.00-33.00
Machine Shop Turnings	26.50-27.50
Mixed Borings, Turnings	26.50-27.50
Short Shovel Turnings.	28.50-29.50
Bar Crops and Plate	34.00-35.00
Punchings & Plate Scrap	34.00-35.00
Chemical Borings	28.00-29.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-44.00
Charging Box Cast	38.00-39.00
Heavy Breakable Cast.	38.00-39.00
Stove Plate	37.00-38.00
Unstripped Motor Blocks	35.00-36.00
Clean Auto Cast	40.00-42.00

CHICAGO

No. 1 Heavy Melt. Steel	$38.50-39.00
No. 2 Heavy Melt. Steel	38.50-39.00
Nos. 1 & 2 Bundles	38.50-39.00
No. 3 Bundles	36.50-37.00
Machine Shop Turnings	33.50-34.00
Mixed Borings, Turnings	33.50-34.00
Short Shovel Turnings.	38.00-38.50
Cast Iron Borings	36.00-36.50
Bar Crops and Plate	41.00-41.50
Cast Steel	41.00-41.50
Punchings	41.00-41.50
Elec. Furnace Bundles.	39.50-40.00
Heavy Turnings	38.00-38.50
Cut Structurals	41.50-42.00

Cast Iron Grades

No. 1 Cupola Cast	46.00-49.00
Malleable	46.00-49.00
Clean Auto Cast	46.00-49.00
No. 1 Wheels	44.00-45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00
Rails, Rerolling	51.00-52.00
Rails, Random Lengths	46.00-47.00
Rails, 3 ft and under	50.00-51.00
Rails, 18 in. and under	51.00-52.00
Railroad Specialties	48.00-49.00
Angles, Splice Bars	48.00-49.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$39.00-40.00
No. 2 Heavy Melt. Steel	36.00-37.00
Machine Shop Turnings	32.00-33.00
Short Shovel Turnings.	33.00-34.00

Cast Iron Grades
(Fob shipping point)

No. 1 Cupola Cast	42.00-43.00
Charging Box Cast	39.00-40.00
Heavy Breakable Cast.	35.00-36.00
Brake Shoes	40.00-41.00
Clean Auto Cast	42.00-43.00
Burnt Cast	35.00-37.00

Railroad Scrap

R.R. Malleable	58.00-60.00
Rails, Rerolling	48.00-49.00
Rails, Random Lengths	42.00-43.00
Rails, 3 ft and under	48.00-50.00
Uncut Tires	43.50-44.50
Angles, Splice Bars	46.00-47.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	**$34.00-35.00**
No. 2 Heavy Melt. Steel	**34.00-35.00**
No. 1 Busheling	**34.00-35.00**
Nos. 1 & 2 Bundles	**34.00-35.00**
No. 3 Bundles	**31.00**
Long Turnings	**34.50**
Short Shovel Turnings.	**26.00-27.00**
Cast Iron Borings	**25.00**
Bar Crops and Plate	**38.50**
Cut Structurals	**38.50**

Cast Iron Grades

No. 1 Cupola Cast	**41.00**
Stove Plate	**39.00**
No. 1 Wheels	**36.00**

Railroad Scrap

No. 1 R.R. Heavy Melt.	**37.00**
R.R. Malleable	**42.50**
Axles, Steel	**39.00**
Rails, Rerolling	**41.00**
Rails, Random Length.	**39.00**
Rails, 3 ft and under	**41.00**
Angles and Splice Bars.	**41.00**

SAN FRANCISCO

No. 1 Heavy Melt. Steel	***$22.00**
No. 2 Heavy Melt. Steel	***22.00**
No. 1 Busheling	***22.00**
Nos. 1 & 2 Bundles	***22.00**
No. 3 Bundles	***17.00**
Machine Shop Turnings	***12.50**
Bar Crops and Plate	**22.00**
Cast Steel	**22.00**
Alloy Free Turnings	**12.50**
Cut Structurals	**22.00**
Tin Can Bundles	**17.00**

Railroad Scrap

Axles	**29.00**
Rails, Random Lengths	**23.50**
Uncut Tires	**30.50**

* **Fob California shipping point.**

SEATTLE

No. 1 Heavy Melt. Steel	**$22.00**
No. 2 Heavy Melt. Steel	**22.00**
No. 1 Busheling	**22.00**
Nos. 1 & 2 Bundles	**22.00**
No. 3 Bundles	**20.00**
Machine Shop Turnings	**13.50**
Mixed Borings, Turnings	**13.50**
Punchings & Plate Scrap	**28.50**
Cut Structurals	**28.50**

Cast Iron Grades

No. 1 Cupola Cast	**27.50**
Charging Box Cast	**22.50**
Heavy Breakable Cast.	**21.50**
Stove Plate	**23.00**
Unstripped Motor Blocks	**21.50**
Malleable	**27.50**
Brake Shoes	**27.50**
Clean Auto Cast	**27.50**
No. 1 Wheels	**24.00**

Railroad Scrap

No. 1 R.R. Heavy Melt.	**20.00**
Railroad Malleable	**27.50**
Rails, Random Lengths	**20.00**
Angles and Splice Bars	**21.50**

LOS ANGELES

No. 1 Heavy Melt. Steel	**$22.50**
No. 2 Heavy Melt. Steel	**22.50**
Nos. 1 & 2 Bundles	**22.50**
Machine Shop Turnings	**16.00**
Mixed Borings, Turnings	**15.50-16.00**
Punchings & Plate Scrap	**28.00**
Elec. Furnace Bundles.	**28.00**

Cast Iron Grades

No. 1 Cupola Cast	**35.00-36.00**

Sheets, Strip . . .

Mills tightly booked until yearend despite better production

Sheet Prices, Page 142

New York — While sheet production is steadily increasing, demand is more than keeping pace, with consumers having difficulty in placing new orders. Mills generally are tightly booked up for the remainder of this year and are accepting nothing for shipment beyond. Some gray material is still available, but at outlandish prices and relatively speaking this tonnage is limited. However, it appears that something is usually available, if the purchaser is willing to pay enough.

Practically all tonnage now moving is against orders placed for shipment before the end of last quarter and this will probably be the case for another month to six weeks. In fact, one large producer finds himself so far behind on deliveries that he has little hope of shipping new tonnage against quotas this quarter. About the only exception to this general stringency is stainless steel, which is being offered by most sellers for shipment within four to five weeks. Electrical sheets continue to ease somewhat, but it is difficult for consumers to buy new tonnage for shipment over the remainder of the year.

Boston — Narrow cold strip mills are filling first quarter schedules on some high carbon and alloy lines, but uncertainty in hot strip supply will probably mean revisions. Low carbon output is restricted by lack of material and users of that grade are frequently in need of tonnage. In hot-rolled, only alloys are available this quarter, carbon schedules being filled. Round wire for flattening has tightened further. Although fourth quarter sheet allocations are often lower, effect of reductions will be reflected later; shipments have not declined to current quota levels due to delivery of delinquent third quarter tonnage. Despite lower allocations, yearend carryovers with most producers will be substantial. Stamping shops are under pressure from customers for earlier deliveries, but find it difficult to meet this demand in view of the continuing tightness in flat-rolled.

Pittsburgh — Sellers report no letup in pressure for sheet and strip deliveries, although monthly output continues at record peacetime levels. Some industry officials state it will be well toward the end of 1948 before the aggregate effect of expansion programs now under way will be fully felt. This expansion program includes 19 cold-reduction mills, of which seven represent speed-up programs for existing facilities; 5 reversing cold-strip mills; 6 hot strip units; and 14 skin or temper pass mills. It has been estimated that, to satisfy present demand for hot and cold-rolled sheet and strip, mills would have to produce at a rate of about 20 million tons annually compared to record prewar year output of 14.5 million in 1941.

Cold-finished spring steel producers recently revised the carbon range brackets in their price lists. The former ranges of over 0.80 to 1 per cent, and over 1 per cent carbon have been revised to over 0.80 to 1.05 per cent and over 1.05 to 1.35 per cent carbon.

Philadelphia — Sheet demand far exceeds supply in all grades, except in stainless and certain other specialties. Clarification of the recent freight advances of 10 per cent points to the full observance of fractions, with a result that on cold-rolled sheets, which take a Pittsburgh base, the delivered Philadelphia price is 3.968c, instead of 3.97c as indicated previously. The delivered prices on hot-rolled and galvanized sheets, based at Sparrows Point, Md., are not affected by this regulation as no fractions are involved.

Cleveland — With demand for light gage, flat-rolled products showing no sign of easing, some steel company representatives are suggesting the use of substitutes, usually aluminum, to consumers seeking supplies of steel. They make this suggestion with the thought that if a manufacturer can be kept in business he will be a potential consumer of steel when the steel supply catches up with demand. Manufacturers still are making personal visits to steel company offices to plead for supplies of steel, particularly sheet and strip. Furthermore, the outlook for the first half is no brighter, a representative of one steel company declared. He ventured the opinion that steel output in the first half may be off at least 5 per cent owing to the necessity of repairing blast furnaces and open hearths which for some time have been pushed to capacity. Although demand for light gage, flat-rolled products remains extremely heavy, one steel company representative expressed the opinion these products will not be the last to be in balance with demand. Pipe may be the last to come into balance, he believes, basing his opinion on the rate at which new facilities will come into operation.

Chicago — Application of the 10 per cent temporary freight rate increase last week has resulted in several eastern sheet and strip makers restricting their distribution areas, with result that consumers in several midwestern locations have been notified that future supplies of steel will not be available. Customers so cut off find themselves in an unenviable position, because finding new sources of supply under present conditions is an almost impossible assignment. Eastern mills, unable to assume further freight absorption, are expected to make further withdrawals from this area if the Interstate Commerce Commission acts favorably on the 25 per cent rate increase plea now before it. An important district mill recently made sharp cuts in customer quotas as a step to reduce its backlog by yearend.

Cincinnati — District sheet mills are producing on capacity schedules, shipments still applying against third quarter commitments. The carryover in some categories will run six weeks and schedules have been set to avoid any further expansion of this volume at the end of the fourth quarter. However, mills foresee slim chance of any major cut in the arrearages. Demand is sustained, with no change in the tight supply situation.

Birmingham — No easing in pressure for deliveries on most wanted items in sheets appears in prospect at least until well after the first of the year. Some quarters are even less optimistic and are predicting that midyear, at the earliest, is the best that can be hoped for. Increasing instances of substitution of aluminum for steel sheets are reported in this section.

St. Louis—Sheet and strip shipments are on the upgrade in this district, currently 10 to 12 per cent above this time a month ago. A bottleneck has been inability to roll ingots as rapidly as they are produced. In the last two weeks, however, a run of easy specifications reduced ingot stocks 2000 tons. Granite City Steel Co. has lighted two extra furnaces in anticipation of mid-November completion of a new cold rolling mill. Of nine small and three large open hearths, six small and two large are now in operation, the others remaining out for repairs. The company expects to offer a limited tonnage of cold-rolled sheets in the first quarter. A heavy carryover prevented an expected offering this quarter.

There is no abatement in demand here, pressure being on the increase if anything. Appeals are increasing from local consumers who want more steel to utilize expanded fabricating capacity, from new warehouses, from users normally far outside this district and from consumers who formerly bought rejects from such big purchasers as auto body companies. The new freight rate increase has not been felt here, since most local steel production goes to local consumers on the St. Louis base rate. Incoming shipments, however, are bearing an approximate 10 per cent boost.

OMD Sets First-Quarter Tin Plate Export Quota

Washington—Tin plate export quota has been set at 120,000 tons for the first quarter of 1948, or the same quota as for the current period. Orders placed against this tonnage will be supported by priority ratings and must be accepted by tin mills. All of this tonnage is required abroad for preservation of perishable foodstuffs.

In addition, 22,000 tons will be licensed on a non-rated basis for use abroad by American oil companies and for other uses permitted by the tin conservation order M-43. Of this 22,000 tons, at least 12,000 tons will be electrolytic tin plate which carries a thin coating. In fact, only electrolytic plate will be licensed for uses other than food packaging.

This information was revealed at a meeting of the Office of Materials Distribution with members of the Tin Plate Industry Advisory Committee last week. The tonnage allowed compares with a statement issued recently by the Office of International Trade that essential foreign requirements in the first quarter will be around 250,000 tons, of which 184,000 tons are needed for perishable food packing alone.

Frank McCue of the Office of Materials Distribution urged the tin plate industry to make every effort to reduce its present abnormal backlog of unshipped orders by wiping off balances overdue when that is practicable. Erwin Vogelsang, chief, Tin Section, OMD, said the first quarter export allocation agreed upon is the maximum permitted by the present tin supply situation.

Steel Bars . . .

Pressure for carbon steel bars eases slightly as users' inventories improve

Bar Prices, Page 142

Philadelphia — Stringency in small and medium-sized hot-rolled carbon bars continues, and consumers of the larger rounds apparently are having difficulty placing new orders for delivery over the remainder of this year. However, buyers of cold-drawn carbon bars find supply fairly easy, except in the very small sizes, and consumers of alloy bars have relatively little trouble obtaining what they want in any size, with deliveries ranging four to five weeks on hot-rolled alloys and five to eight weeks on cold-finished alloys.

Clarification of the recent freight rate increase indicates that fractions will be observed. Thus, on bars based at Pittsburgh, the new rate into Philadelphia is 41.8 cents, instead of 42 cents. The current price on hot-rolled carbon bars is 3.318c, delivered Philadelphia, against 3.28c prior to the Oct. 13 rate advance.

New York—Pressure for small carbon bars continues strong, this even applying to cold-finished bars, which in general have been in easy supply over recent months.

Sellers of hot-rolled bars have not as yet opened their books for next year. Cold finishers have long been taking such future tonnage as is available and, in the case of the small specifications, most sellers are booked into the second quarter, only one interest having accepted business for the third quarter The medium and larger sizes of cold-finished carbon material are readily available for shipment this year, with quite a scramble among the cold finishers for tonnage of this character.

Inasmuch as fairly nearby deliveries can be had, consumers are showing little interest in placing tonnage in the medium and larger sizes of cold finished for next year. However, some scattered orders are being booked.

Hot-rolled carbon bars are difficult to obtain except in the larger specifications, and even the latter are in none too easy supply, as certain of the larger producers are booked up solidly for the remainder of this year. Hot alloy bars can be had in three to five weeks, with cold alloy material requiring an additional two to three weeks for processing.

Boston—Hot-rolled carbon bar supply continues limited in small sizes here, but in a few scattered instances, warehouses included, current deliveries have improved slightly. On the whole, however, there is some tightening in heavier sizes of hot-rolled stock. The easing in cold-finished, which has improved the inventory position of more consumers, is slow to show up in improvement of hot-rolled. Forge shops using alloys are in a comfortable position as to supply.

Pittsburgh — Overall supply of carbon steel bars has improved slightly in recent weeks, with some sellers reporting definite easing in pressure for deliveries, particularly in large size classifications. Shipments of both carbon and alloy bars to cold-finishers are in ample volume to meet present requirements. However, demand for cold-finished bars is well below war peak levels although still substantially above prewar peacetime volume. Most cold-finishers experienced a steady downward trend in new order volume and number of order cancellations throughout the summer, but this situation has been reversed recently reflecting fact customers' inventories are now in better balance with projected production schedules. Cold-finished rounds are available within 30 to 60 days, with latter deliveries prevailing on smaller size classifications; narrow flats are extended 90 to 120 days. Warehouse interests continue to be major mill source for cold-finished bars, although stocks are more than ample to meet current requirements among most distributors.

Seattle — Rolling mills cannot keep pace with the demand for merchant bars. It is necessary to decline many orders, preference going to regular customers and emergency public works. Capacity operations are making little headway against heavy order backlogs.

Plates . . .

Plate Prices, Page 143

Boston — Unable to get 20-inch pipe for the Portland, Me.-Montreal pipeline, sponsors are also unable to place contracts for plates or the fabrication of the plates for the project, which requires 50,000 tons. New volume of plate tonnage being accepted for fourth-quarter delivery is small, mill schedules being filled. Substantial yearend carryovers are expected. For this reason, orders beyond the current quarter are few on a firm basis. Due to the increase in freight rates, lowest delivered price on carbon steel plates, delivered Boston, is 3.423c, Sparrows Point, Md., base.

New York — Although the movement of plates has picked up somewhat over recent weeks, most if not all of it is against back orders and consumers find it as difficult as ever to place new tonnage. The mills have little to offer over the remainder of the year, although they are working in some tonnage, where an opportunity is afforded to do some special forming on it. Light gage plates under 1/4 inch continue in dominant demand. This tonnage is still available, where special operations can be performed, but even so little can be had for shipment over the remainder of the year.

Some fabricators, although still in need of tonnage, assert that inventories are becoming in better balance in relation to certain other products. They believe that once this balance is reached it will have a rather quick reflection in the volume of demand. Car builders, however, appear to be as badly in need of plates at present as of any other one item.

Birmingham — There has been only a negligible easing in pressure for plates. Indications now are that there will be a substantial carryover of plates into 1948. This is almost certain to be the situation as long as current high production levels are maintained in cars, tanks and in miscellaneous needs for plates. No word is forthcoming yet as to opening of books for next year's delivery.

Seattle — Plates continue in short supply with a strong, steady demand. Agencies report eastern mills have not opened their books for the first quarter. Consequently, stocks are out of balance and some projects are being deferred due to conditions. Shops in this area report a fair run of work, operations being near capacity.

Wire . . .

Production emphasis is on plain wire with the supply-demand situation still tight

Wire Prices, Page 143

Pittsburgh — Demand-supply situation in wire rods continues tight and there is little indication of improvement through remainder of this year. With exception of lighter gage wire items, there is no let-up in pressure for delivery of manufacturers' wire items. Jobbers' stocks of nearly all merchant wire products remain unbalanced and well below normal. Mill production emphasis is on plain wire requiring a minimum amount of handling and processing; overall output is slightly improved due to cooler weather. However, most sellers will be forced to block out 3 to 4 weeks' output this quarter to clean up accumulated carryover tonnage. There was some question as to mill policy in offsetting recent freight rate advance on fence, barbed wire, and bale ties which are sold on a volumn basis, freight charges for which were computed on basis of the charge divisable by five.

Boston — Wire shortages are more acute with users of low carbon stock and admittedly production of that grade reflects a low margin price structure. Consumers have raised the question, namely: If the price is too low, why not an increase to raise output of these grades? Demand for most grades of wire holds at a high level with incoming high carbon volume slightly in excess of shipments. High ratio of this volume is longer processed tonnage, and tempering, annealing and coating capacity is heavily loaded. Most mills are now taking orders and making allocations for first quarter.

Birmingham — Consumer requirements for wire continue to outstrip production, although production remains at virtual capacity in most wire products. The same situation obtains in all wire specifications. Agricultural sources continue to report shortages of baling wire, wire fencing and other items which have remained in constant demand due to continued unseasonably warm weather.

Tubular Goods . . .

Tubular Goods Prices, Page 143

Seattle—Demand for cast iron pipe is temporarily quiet, although the potential market in this area is of major proportions. Delays in making deliveries, aggravated by a continued strike of longshoremen in California, is increasing the acuteness of the situation. Yakima, Wash., announces it is forced to discontinue installation because shipments are held aboard ship and cannot be forwarded by rail because they cannot be discharged from the water carrier.

Structural Shapes . . .

Structural Shape Prices, Page 143

New York — Structural shops are increasing their backlogs rapidly, reflecting a substantial increase in orders over the past two months. Much work is still in prospect, with fabricators anticipating a peacetime peak by possibly next spring. An outstanding recent order in this district involves 2500 tons for a freight terminal in Newark, N. J., for the New York Port Authority. Two to three jobs, as large or larger, are expected to be placed shortly.

Philadelphia — While shape supply appears a trifle easier, this situation is expected to stiffen again shortly, with one important eastern unit scheduled to suspend later in the year for repairs. Meanwhile, fabricating shops are operating at a high rate against order backlogs that in some cases extend six or seven months ahead. With the full fraction being observed in applying the recent freight increase of 10 per cent, instead of dropping the fraction under a half cent, the delivered Philadelphia price on shapes is 2.954c.

Structural awards locally have been rather light of late, although a fairly substantial amount of tonnage is pending in the aggregate. State bridge work, both in Pennsylvania and New Jersey, involves several fair-sized jobs, with the general flow of this work noticeably more active than during last summer.

Boston — Numerous small state bridges in New England account for close to 850 tons, but these contracts call for little shop work, being mostly beam spans. Probably the first large tonnage to come out next year will be the state bridge, Gloucester, Mass., approximately 5000 tons. The pinch in plain material, including warehouse shortages, is partially the reason much fabricated work is behind schedule, although the two producers of plain shapes are heavily booked. The number of shape producers has shrunk to two and some rolling mills are in need of repairs. Heavy contributions to the railroad car building program also holds down quotas to fabricators.

Birmingham — Shape inquiry has tended upward over the past several days. Volume is good in the aggregate. Warehouse inventories are reported especially low. Some fabricating shops report a steady flow in small jobs.

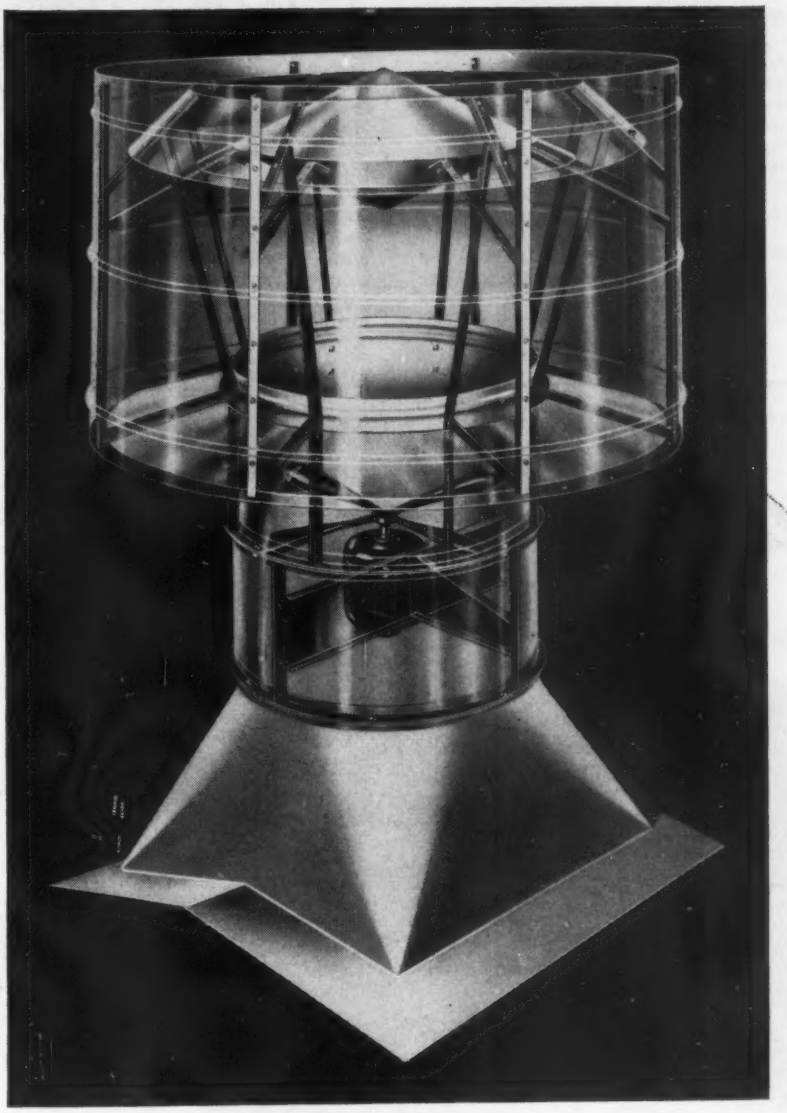
Seattle — Fabricators report mill allocations and deliveries are restricting operations. For rush jobs, steel is being routed by rail as the intercoastal water service is temporarily undependable. Shops are reasonably busy but could use twice the available stock of shapes.

Pig Iron . . .

Pig Iron Prices, Page 144

Pittsburgh — The huge pent-up demand for gray iron castings is subsiding to more realistic levels. An increasing number of gray iron foundries report substantial progress in clearing up order backlogs, as reflected in relatively prompt deliveries now available in some instances. During the first half this year the industry's production approximated 6.5 million tons, or at an annual rate of 13 mil-

BURT FREE-FLOW FAN VENTILATOR



FOR HIGHLY EFFICIENT POWER VENTILATION

When a large volume of air must be exhausted quickly and efficiently, the Burt Free-Flow Fan Ventilator is a logical choice. It may be spotted directly over the area to be ventilated or used on duct work flues to increase their capacities. When its fan is not in use, it serves as an efficient gravity ventilator. With its fan in operation, capacity is greatly increased and positive exhaust is assured regardless of access to wind flow. See Sweet's or write for further information on the efficient Free-Flow Fan and other Burt Ventilators.

WRITE FOR CATALOGS AND DATA SHEETS

The **BURT MFG.** *Co.*

905 S. High Street Akron 11, Ohio, U.S.A.

VENTILATORS • LOUVERS • OIL FILTERS AND SHEET METAL SPECIALTIES

lion tons, which is 30 per cent above the peak production attained in any prewar year. No one can definitely say at what volume the future demand will level off. To reflect the 10 per cent increase in freight rates, the delivered prices for Neville Island, Pa., base pig iron to Pittsburgh have been revised as follows: No. 2 foundry and malleable, $37.41; basic, $36.91; and bessemer, $37.91.

New York — Pig iron demand is increasingly strong, a recently contributing factor being the further substantial increases in scrap prices. These higher prices have caused foundries in this district to press still harder for pig iron but with little or no success. Most consumers look for the supply of iron to become tighter before increased capacity has an opportunity to make itself felt. The closing weeks of the year may witness the turn, in the opinion of some trade observers.

Reflecting the 10 per cent increase in freight rates, No. 2 foundry iron is now holding at $39.52, delivered Newark, N. J., and $40.80 delivered Brooklyn. Basic is $39.02, delivered Newark; bessemer, $40.52; and malleable, $40.02. Malleable delivered Brooklyn is $44.30.

Boston—The trend toward heavier melt of malleable is steady among New England foundries and Mystic furnace is operating 10 to 12 days each month on that grade. This malleable schedule would be longer if ore were available. Although the Everett furnace is operating largely on Lake Superior ore, some Swedish and North African is used. While pressure for iron has eased slightly, few foundries have appreciable inventories and basic consumers are operating hand-to-mouth. Ratio of scrap in foundry melts is up an average of 25 per cent since the supply of pig iron became limited, but a few shops have upped the ratio of iron moderately of late.

Philadelphia — Consumers are becoming increasingly discouraged over the outlook for pig iron. General belief is that supply will get worse before it gets better and that even at best iron supply will continue highly stringent throughout the winter. One large furnace at Sparrows Point, originally planned for completion late this year, will probably not get into blast, from present indications, until some time in the first quarter. Inferior quality of coking coal, to say nothing of an actual shortage of coke in some areas feeding the district, is proving an important handicap. However, the scheduled time for the blowing out of one eastern Pennsylvania furnace for major repairs has been postponed. It was originally scheduled to go down Oct. 1, but now an effort is being made to keep it in operation until late November.

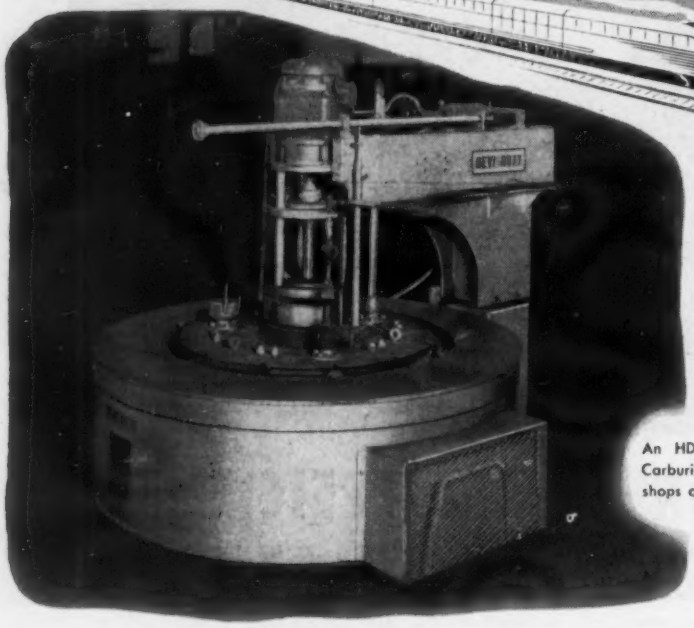
Cleveland—Demand for merchant pig iron continues unabated although it is reported some foundries are experiencing a slight decline in receipts of new orders for castings. All foundries have a substantial backlog of orders and their desire is to transform these into shipments as rapidly as possible. Consequently, there is no easing in demand for iron. Furthermore, a high rate of production has made it impossible for foundries to build up stocks of iron. Difficulty in obtaining sufficient pig iron has resulted in use of increased proportion of scrap iron in melts, with a resultant loss of castings in some instances because of unsatisfactory quality. Considering all of these factors, an easing of demand for castings will not be reflected immediately in pressure for iron.

Application of the interim railroad freight rate increase has increased the delivered price of pig iron at Akron from Cleveland by 17 cents a ton, making basic $37.34, No. 2 foundry $37.84, malleable $38.34, and bessemer $38.84. Delivered price at Mansfield, O., from Youngstown rose 30 cents a ton, making basic $39.28, No. 2 foundry $39.78, malleable $39.78, and bessemer $40.28.

Chicago — Unable to obtain adequate supplies of foundry pig iron, makers of castings are using small lots of basic iron as fill-in material when the latter can be obtained. Supply of iron is as tight as ever and producers and suppliers are being pressed as hard as ever for shipments. Iron production holds at the high level of recent weeks with 41 of 42 blasts in the district in operation, but substantial proportion of the output is hot metal for steelmaking use.

Buffalo — Many foundries report operations have been hit by the continued idleness of a blast furnace which was banked more than a month ago because of insufficient coke supplies. The producer is still unable to obtain ample coke to place the unit back in operation. As a result, shipments of motor castings into Michigan have been cut. This is cited as one of the factors limiting the pro-

Another
HEVI DUTY CARBURIZER INSTALLATION



An HD-2447 Vertical Retort Carburizer at the Decatur, Illinois shops of the Wabash Railroad.

IN their recent installation of a Hevi Duty Vertical Retort Carburizing Furnace at their Decatur shops, the Wabash Railroad is following the trend of progressive railroads in installing modern equipment to assure dependable and accurate heat treatment of locomotive and car parts. This "all purpose" heat treating furnace can be used for carburizing, nitriding, bright annealing and clean hardening. Its economy warrants its use even though its operation may not be continuous. Bulletin HD-646 has the details — send for it — today.

HEVI DUTY ELECTRIC COMPANY
HEAT TREATING FURNACES HEVI DUTY ELECTRIC EXCLUSIVELY
MILWAUKEE 1, WISCONSIN

duction of new cars. Foundries report they have been unable to maintain previously arranged production schedules because of the tight merchant iron market. Meanwhile, a heavy drain on iron output also is reported by ingot producers.

Cincinnati—Shipments of pig iron, both northern and southern, are expected to reach tonnage alloted for the month, enabling foundries to maintain production at levels holding for the last three or four months. Under present conditions, with supply far under demand, higher delivery cost because of freight rate increase causes no effect on the market.

Birmingham — While no change is foreseen in shipments of pig iron during the remainder of the year, merchant iron production remains considerably below the district's requirements. As usual, larger consumers with regular supply sources are better off, although they are suffering, than the smaller users. All iron users are operating on reduced schedules.

St. Louis—Pig iron production has remained unchanged at the 1000 ton a day level for several months. Koppers' Granite City, Ill., furnaces thus far have overcome coke shortages and their iron ore supply for the winter is practically all in. Of the 1050 tons of coke consumed daily, it makes 850 tons and buys half of the deficit locally and half from Koppers in St. Paul. Iron melters in this district complain of shortages but, since their quotas are unchanged, it stems largely from their desire to increase consumption. Apprehension they might lose their source of supply through sale of the Koppers plant to outside interest has been eased since opening of bids by the War Assets Administration revealed Missouri & Illinois Furnace Inc., a corporation set up by the Koppers and M. A. Hanna interests, submitted the high offer of $3,550,00. With the bid went assurance local iron allocations would not be changed.

Iron Ore . . .

Iron Ore Prices, Page 144

Cleveland — Shipments of Lake Superior iron ore declined slightly the week ended Oct. 13 to 2,277,950 tons from 2,400,119 tons during the preceding week but showed an increase over the 2,222,699 tons shipped during the like 1946 week, according to the Lake Superior Iron Ore Association, this city. This brought the cumulative total for the season to Oct. 13 to 65,717,617 tons compared with 46,923,352 tons for the like 1946 period.

United States ports accounted for 2,213,425 tons, or an average daily loading of 316,204 tons, in the week ended Oct. 13 compared with 2,171,977 tons, or a daily loading of 310,282 tons, in the like 1946 period. For the season to Oct. 13, these shipments totaled 64,329,861 tons, or an increase of 18,432,266 tons over the like 1946 movement of 45,897,595 tons.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 144

Pittsburgh — Oven foundry coke price delivered here from Fairmont, W. Va., ovens has been increased to $17.71 per net ton to reflect advance of 10 cents a ton in railroad freight charges put into effect last Monday. Connellsville beehive furnace coke continues to sell in range of $12 to $12.50; excluding special contract price of $11.50 for one large consumer, under which agreement the buyer furnishes the coal.

Supply of oven foundry coke remains very tight in this district. Foundries' inventories of beehive coke are in fairly good balance with present requirements. In most instances pig iron, rather than coke, is the major retarding factor preventing full capacity foundry operations. Accentuating the overall tight supply situation in coke is fact that lack of coal has forced many domestic consumers to turn to coke.

Philadelphia — As a result of the freight increase on coal, district oven foundry coke producers have advanced prices 15 cents a ton, to $16.90, Philadelphia and Swedeland, Pa., ovens.

Open House Draws 6000

Hamilton Foundry & Machine Co.'s open house at Hamilton, O., Oct. 11 and 12 attracted approximately 6000 visitors, including employees' families, civic, educational and industrial officials. All operations in the making of castings were demonstrated and according to P. E. Rentschler, president, "some erroneous beliefs as to foundry jobs were dispelled."

why more cooling requirements and more operating conditions are served than with any other make

ROSS

STANDARD "CP" COOLERS

● "Standard", in any product, naturally implies more favorable cost and more favorable delivery. That's so with Ross Standard "CP" Coolers . . . *PLUS* the fact that, where necessary, mass produced standard parts may be specially assembled and arranged for highest heat transfer under *your own conditions.*

You'd think, then, that practically *ANY INDUSTRY,* requiring circulation of oil, water and other fluids for heat removal, would have little choice to make. That's right! Both machinery builders using coolers as original equipment, as well as industrial consumers making their own installations, show a great preference for this all-purpose Ross unit. They continually select the "CP" design, knowing that both normal and special problems of installation, operation and maintenance can be regularly served without the need for high cost, special engineering and fabrication.

For your requirements, do as thousands have done. Call in a Ross Heat Exchange Engineer to make an analysis and recommendations.

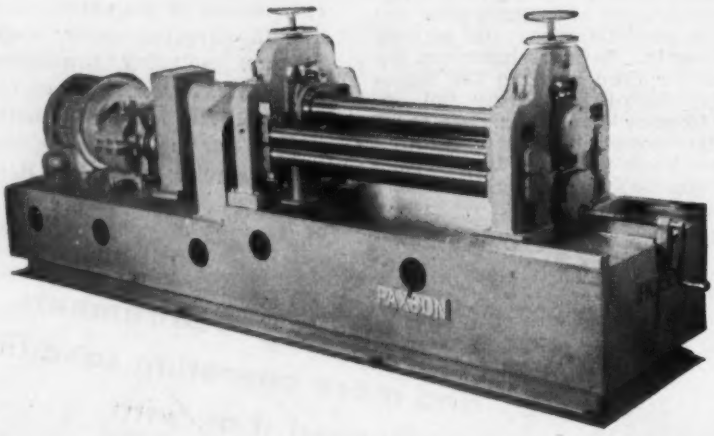
ROSS HEATER & MFG. CO., INC.
Division of American Radiator & Standard Sanitary Corporation
1431 WEST AVENUE BUFFALO 13, N. Y.

FREE BULLETIN IS VALUABLE AID TO COOLER SELECTION
Request Bulletin 5322 on your Company letterhead.

Ross equipment is manufactured and sold in Canada by Horton Steel Works, Ltd., Fort Erie, Ontario

IT'S NO JOKE SON!

If you slit *either* SHEETS or COILS



You need our new 48" SHEET or COIL trio-housing SLITTER

BUILDERS OF COMPLETE SLITTING LINES

PAXSON MACHINE CO.

SALEM, OHIO

PERFORATED METALS

Any Metal · Any Perforation

INDUSTRIAL and ORNAMENTAL

The Harrington & King PERFORATING Co.

5634 FILLMORE STREET, CHICAGO 114 LIBERTY ST., NEW YORK

U. S. Steel Export Co. Revises Carbon Steel Prices

New York—United States Steel Export Co., 30 Church St., has revised its price schedule, effective as of Oct. 13, covering the following carbon steel products. This action was taken to reflect the increase in freight rates. Prices are on the basis of fob mill with freight included to New York, Philadelphia and Baltimore. Terms are all net cash and subject to adjustment to seller's prices in effect at time of shipment from the mill. The new prices are as follow:

	Per Gross Ton
Blooms, billets and slabs	
Rerolling	$55.93
Forging	65.93
Wire rods	73.18
	Per 100 lb
Std. structural shapes	$3.36
Sheet piling	3.86
Plates	3.61
Floor plates	4.86
Skelp	3.16
Bars, hot-rolled	3.61
Bars, concrete reinforcing	3.46
Sheets, hot-rolled, 18 ga. & heavier	3.54
Sheets, galvanized	
Plain 10 gage	4.41
Corrugated 10 gage	4.51
Sheets, Cold-rolled, 15 ga.	4.24
Strip, hot-rolled	3.36
Strip, cold-rolled (0.25C and under)	4.11
Joint bars for std. rails	4.23
Tie plates	4.23
Wire, bright nail	4.11
Wire, black annealed	4.76
Wire, Plain, galvanized	5.21
Nails, bright	4.83
Staples, bright	5.63
Staples, galvanized	6.58
	Per Net Ton
Rails, stand. No. 1	$68.47
Rails, light	72.82
	Per Base Box
Tin plate, Amer. coke 107#	$6.91
	Per 80 Rod Spool
Wire, barbed	
Lyman 4 pt. 5 in.	$5.00
Glidden 2 pt. 4 in.	4.59
	Discount
Pipe, Amer. stand, T & C	
Buttweld, 2½" & 3", black	52.4
Buttweld, 2½" & 3", galv.	37.9
Seamless, 3½" to 6", black	47.4
Seamless, 3½" to 6", galv.	32.4
English gas tubes, T & C	
Buttweld, 2½" & 3", black	51–½
Buttweld, 2½" & 3", galv.	40.0

Carbon Ingots Selling at $80 to $85 on Open Market

Cleveland — Open market price range for carbon steel ingots appears to be established now at $80 to $85 per net ton although this range may be pushed higher if the scrap market rises further, as anticipated by some steelmakers.

Shipments of ingots, mostly for conversion into sheets, now are running 60,000 to 75,000 tons monthly. Of this total, 21,000 tons are coming down from an Ohio mill, of which 17,000 tons are being converted into sheets by a Chicago mill with excess rolling capacity. Another Ohio mill is reported to be shipping 4000 tons monthly. An Ohio river mill is shipping 28,000 tons.

In the Pittsburgh district, one mill is shipping 7500 tons from one plant and 3500 tons from another nearby. A second mill is moving about 10,000 tons monthly.

An Eastern interest is reported to have entered the Detroit market with

offerings of ingots at $80 a ton. Generally, prices are figured on a scrap conversion basis. In one case, the contract price is based on a conversion charge of $39.03 per ton, plus 110 per cent of the cost of scrap. This means that ingots made from $45 scrap cost the buyer $88.53.

Sheet bar prices as high as $92 per ton are being heard currently. One deal, it is said, was worked out on the basis of $75, f.o.b. mill.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 142

Seattle — Bulk of demand in the bar market is for reinforcing. Many small tonnages, generally for less than 100 tons, are being placed here for industrial and commercial construction.

Warehouse . . .

Warehouse Prices, Page 145

Cleveland—Warehouses here have revised prices on certain steel products to cover the recent increase in transportation costs. There was no change, however, in those cases where the freight rate increase affected only the switching charge. The new Cleveland delivered prices are as follows: Galvanized sheets, 5.79c for 10 gage and 7.04c for 24 gage; hot-rolled strip, 4.52c; structural shapes, 4.65c; carbon steel plates, ⅜ to ¾-inch thick and up to 90 inches wide, 4.60c; floor plates, ⅜-inch and thicker, 6.15c; hot-rolled alloy bars (4140), 6.93c.

Tonnages are being placed with warehouses on a firm price basis, although at least one jobber is asking 30 points above published prices for cold-rolled strip. The seller justifies this practice on the fact that he is receiving a larger than normal proportion of narrow sizes on which there is an above average loss in processing. At the same time, a practice which had been adopted by several sellers a few weeks ago of selling small tonnages on a carlot price basis has been discontinued. This was attributed to an effort to reduce an overstocking of certain grades of material, chiefly alloys.

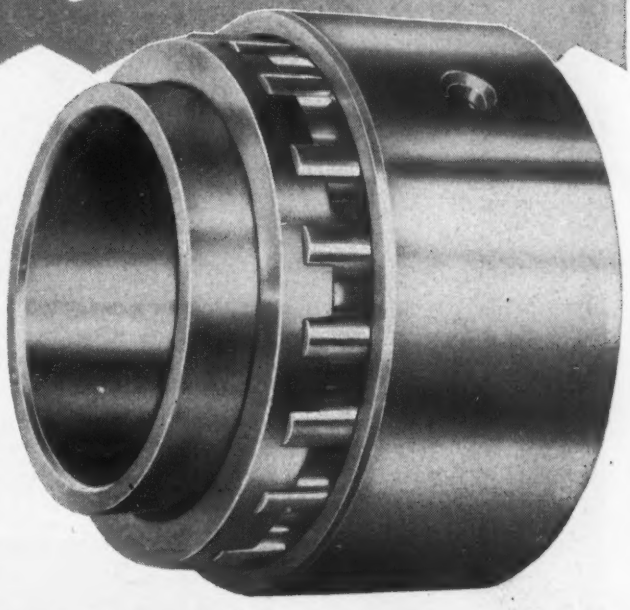
New York — Some distributors are getting some increase in tonnage of structurals in bar sizes, representing tonnage in excess of allocations. This is not the case with other carbon steel products which are in short supply, notably flat-rolled products. Sheet quotas are lower for the final three months of the year than they were in the third quarter. Most warehouses' overall sales are geared closely to the ability of distributors to supply material, demand being far in excess of available tonnage. In galvanized sheets, hardly more than 25 per cent of expected tonnage has been taken in by warehouses during the first 10 months of the year. Outlook for bars is improving gradually with supply of cold-finished bars balancing demand as is the case with alloys, tool steels and most specialties. Stocks of wire products and strip are below requirements.

Philadelphia — Jobbers are advancing prices to compensate for the recent increase in freight rates on inbound tonnage. Some leaders have already advised customers of new list prices, while others are expecting to do so shortly. Meanwhile business continues highly active, with the daily average so far this month in excess of September. However, some of the larger distributors report a falling off in shipments from the mills, and, consequently, doubt whether they will be able to maintain the present rate of business in November. Supply of flat carbon products and small carbon bars is increasingly stringent.

Pittsburgh — Increase of 10 per cent in rail freight rates last Monday will not necessitate an upward adjustment in warehouse steel base price quotations for this district on country delivery since all products handled are produced here. However, customers will have to absorb the freight advance on shipments outside the local switching area; and there may be some revision in the warehouse price spread for city delivery to reflect increase in rail switching charges.

For the first time this year some steel distributors reported monthend inventory position at close of September failed to follow downward trend of preceding months this year. Inventory position of all the steel distributors here, however, is said to be well below level necessary to meet the urgent needs of many customers. This is particularly true in sheets, plates and shapes. Due to substantial mill product carryover tonnage commitments, warehouse interests are not going to receive full mill tonnage al-

American
"Extra" Heavy-Duty
Roller Bearings
for the toughest anti-Friction jobs



Here is a "super" bearing designed especially for *super, heavy-duty* service. Its simple construction, absolute precision and tremendous strength assure smooth, dependable performance in the heaviest machinery under the most difficult operating conditions. Complete technical data furnished without obligation. Write.

AMERICAN
ROLLER BEARING CO.
420 Melwood Street Pittsburgh, Pa.

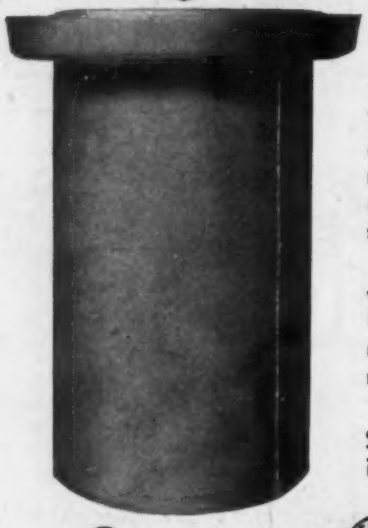
AMERICAN ROLLER BEARINGS

Pacific Coast Office: 1718 S. Flower St., Los Angeles, Calif.

STANWOOD DID BOTH IN THIS NEW RETORT

QUALITY and SERVICE LIFE UP!

PRICE DOWN AS MUCH AS 24%



A new Stanwood design, plus advanced fabricating technique, reduced the price of the retort pictured 24.4%. At the same time, greater service life is assured.

Retort top and upper sealing trough are cast as a single unit. The result, by means of special pouring methods, is a dense, uniform casting which will hold its shape throughout the life of the retort. The balance of the retort is made of high density, rolled plate and bar. These materials, plus Stanwood fabrication methods, are your assurance of high quality and long service.

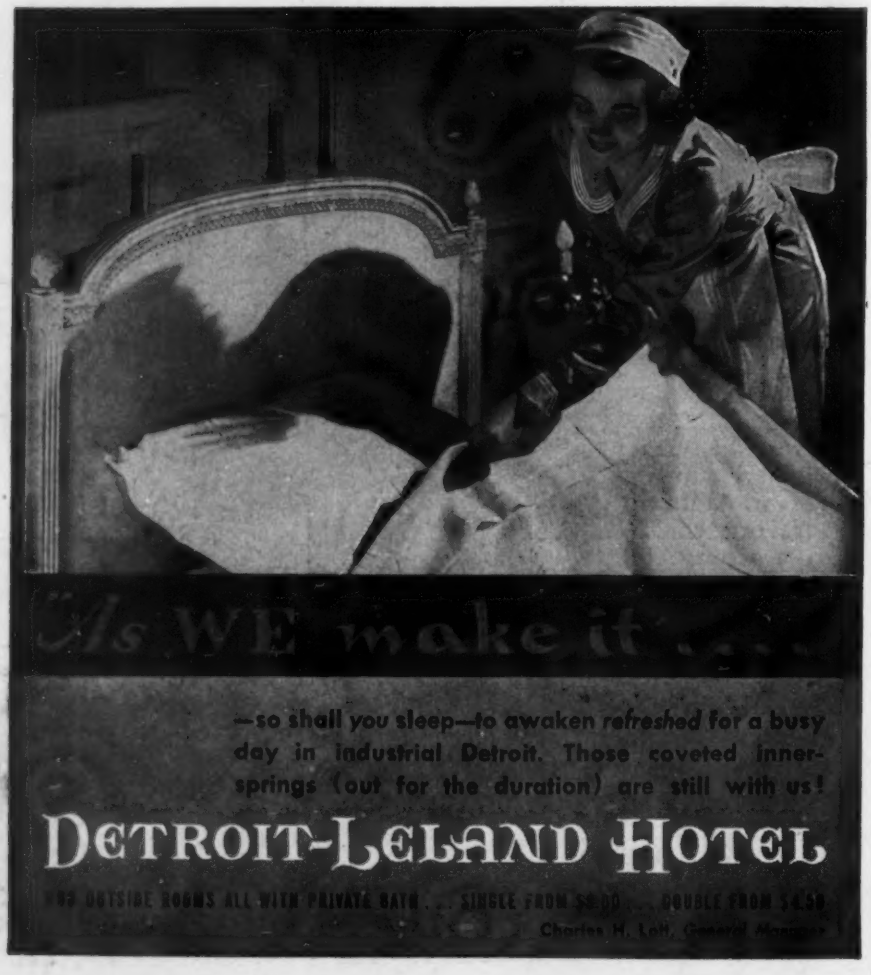
The new design has been tested for three years under actual service conditions. Its longer service life assures a saving for the user of substantially more than the price reduction of 24.4%.

Send for new Catalog 16, which presents Stanwood retorts, baskets, trays, carburizing boxes and fixtures.

Stanwood Corporation

FABRICATED METAL PRODUCTS

4825 W. Cortland St. Chicago 39, Ill.


It's WE make it . . .
—so shall you sleep—to awaken refreshed for a busy day in industrial Detroit. Those coveted innersprings (out for the duration) are still with us!
DETROIT-LELAND HOTEL

lotments previously promised for this quarter. This situation is further accentuated in the case of one large producer that is forced to undertake a large scale blast furnace relining program, full effect of which is scheduled during first half next year.

Chicago — Warehouses in this district are holding Chicago city and country prices unchanged but for outlying cities have increased price by amount of the 10 per cent temporary freight increase recently granted the railroads.

Distributors have substantial inventories of cold-drawn bars, alloys and stainless steel, but almost no stacks of carbon steels. It is understood overall stocks are considerably less than at the beginning of the year but slightly better than two or three months ago. In several instances, warehouses have had their mill quotas for fourth quarter reduced, consequently they expect to have less steel to distribute customers for balance of the year. This makes it necessary that available supply be rationed more diligently than in the past.

Cincinnati—Demand for steel from warehouses will be unaffected by the amount of price increase necessary to cover the emergency freight rate rise. New schedules, in preparation, will reflect as heretofore the different freight charges from basing points which vary with type of products. Sales this month are holding near the September level.

Memphis, Tenn. — Warehouse steel prices have been revised here to reflect the recent increase in freight rates. New delivered prices within the city limits are as follows: Hot-rolled sheets, 18 gage and heavier, $4.82; cold-rolled sheets, $5.87; hot-rolled rounds, 4 1/8-inch and larger, $5.17; structural shapes, $4.97; hot-rolled plates, $5.17; floor plates, $6.87; and cold-finished carbon steel bars, $5.87.

Omaha, Nebr. — Distributors' steel prices have been revised to take into account the 10 per cent increase in freight rates. The new prices, effective as of Oct. 13, on an fob Omaha basis are as follows: Hot-rolled sheets, 5.365c for 10 gage; galvanized sheets, 6.565c for 10 gage and 7.815c for 24 gage; hot-rolled strip, 5.265c; bars, 5.315c for hot-rolled and 6.015c for cold-finished; structural shapes, 5.315c; plates, 5.515c; and floor plates, 6.965c.

Los Angeles—Many steel jobbers in this area, if asked how much competition they have to meet, would say that about 25 to 30 houses are in the same field of business in that region. Actually, the number of firms selling steel in the form it is received from mills reaches the total of 75 in the immediate metropolitan area.

This was clearly indicated last week in a spot check made by a STEEL reporter following disclosures by a leading Los Angeles jobber that a company survey had just been concluded which showed that of the 75 new concerns, more than half have launched into business within the last 18 months.

In many instances the newcomers are fabricators of specialty items while still engaging in the jobbing of sheets, plates, bars and nearly every other steel shape.

One direct and obvious result of this surge of enterprise here is the development of unusually keen com-

petition among the steel jobbing trade. This fact, coupled with a reported slight falling off of demand, has led into a current era of augmented sales effort virtually unknown in the region in the past.

Another direct result of increased competition has been sharp rises in inventories as smaller concerns seek to approach variety in stocks carried as a matter of course by their larger business rivals.

Seattle — Wholesale jobbers report a steady demand for all items, shipments as a rule moving directly to the job. For this reason, inventories are not increasing and stocks are badly broken. The critical items show no improvement and when possible substitutions are being used. Considerable tonnage for this area is still aboard strikebound ships and this market is turning to rail shipment at higher freights to insure delivery dates.

Scrap . . .

Scrap Prices, Page 148

Philadelphia—Steel scrap continues strong, with the major steelmaking grades higher at a flat $40 delivered, and leading sellers are no longer accepting business at this figure. In fact, some are temporarily out of the market entirely until they can fully appraise the supply situation following the preceding week's sharp advance. Mill inventories of melting steel have shrunk over recent weeks and with winter approaching and pig iron becoming increasingly stringent, pressure for scrap is the heaviest in considerable time.

The $40 price applies to the principal steelmaking grades down to and including No. 2 bundles, with No. 3 bundles now at $38, delivered. Machine shop turnings at $34 to $35, represent a substantial jump from the preceding week and reflect in part substantial buying by a leading consumer of this particular grade. Low phos scrap continues to advance, with bar crops and plate, punchings and plate scrap and cut structurals quoted at $44.50 to $45; electric furnace bundles and heavy turnings are unchanged, but strong. While No. 1 cupola cast is unchanged, No. 1 machinery is higher at $49 to $51, delivered, charging box and heavy breakable have moved up to a flat level of $48 and clean auto cast is higher at $49 to $51.

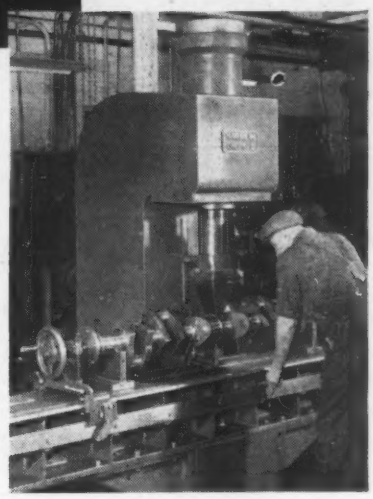
The leading eastern consumer of melting steel again is taking shipment for Steelton, Pa., after a suspension of about a month. Also, for the first time since last June, this interest is now moving scrap from its shipbreaking yard in Baltimore. However, operations at this yard are still being affected by a strike, which is tying up operation at various eastern shipyards.

New York — Local brokers' buying prices have leveled off following the $2 advance on the major steel grades a week ago. Demand is active but consumers are showing increasing resistance to the higher delivered prices, with this being reflected in brokers' prices. All grades are unchanged excepting electric furnace bundles, which are up $1 to $37, fob shipping point.

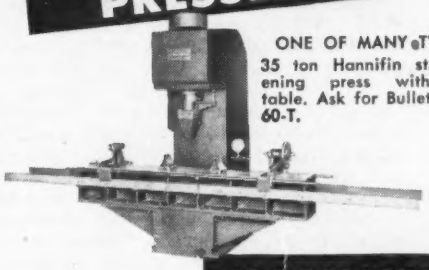
Lipsett Inc., 80 Wall St., has been awarded the battleship *New Mexico*

Saves time... PAYS FOR ITSELF!

By reducing the time required for grinding . . . by minimizing rejects . . . this Hannifin hydraulic straightening press pays for itself! The use of straightening presses for truing parts after heat treating and before grinding is well-known, yet many opportunities to make savings still are overlooked. Ask for recommendations.



HYDRAULIC *straightening* PRESSES



ONE OF MANY TYPES
35 ton Hannifin straightening press with 90" table. Ask for Bulletin No. 60-T.

TYPICAL USES

Straightening crankshafts (as shown above), axle, cam, and line shafts, lathe spindles, machine tool guide rails, cylinder stock, gear countershafts, splined shafts, piston rods, and airplane propellers.

HANNIFIN CORPORATION
1101 So. Kilbourn Ave., Chicago 24, Ill.
AIR CYLINDERS · HYDRAULIC CYLINDERS · HYDRAULIC PRESSES
PNEUMATIC PRESSES · HYDRAULIC RIVETERS · AIR CONTROL VALVES

PRECISION PRODUCTS
to Close Tolerances

As a result of its wartime activities in manufacturing gun parts, which brought the Army-Navy Award with three stars, the Hendrick plant now has surplus facilities available for making small to medium size precision products to close tolerances. In fact, it is common procedure for Hendrick's experienced machine tool operators to work to a tolerance of .0005 inches.

If you will submit specifications and samples of products on which you wish quantity prices, we will quote promptly.

SEE OUR CATALOG IN SWEET'S

HENDRICK
Manufacturing Company
30 DUNDAFF STREET, CARBONDALE, PENNA.
Sales Offices In Principal Cities

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

for scrapping. As noted in a recent issue, this company was high with a bid of $381,600. The *New Mexico* at present is berthed at Boston, and has a decommissioned weight of around 30,000 tons. Bids on two additional battleships, the *Wyoming* and *Idaho,* will be opened by the United States Navy Disposal Office here Oct. 27. They are berthed near Norfolk and have a decommissioned weight of 15,000 tons and 26,000 tons, respectively.

Pittsburgh — Considerably stronger price tone is developing, although in absence of mill purchases for local heavy melting steel no upward adjustment in quotations for that type of material was warranted by the close of last week. However, on basis of prices in other districts, which would make delivered prices here for remote material within the range of $43.50 to $45, the local price would appear to be entirely out of line. Leading brokers contend they have been forced to pay $40 and higher for heavy melting to cover on old $38 orders.

Reflecting the stronger market, advances of $1 to $1.50 were reported in turnings; No. 1 cupola was up $1 and heavy breakable cast up 50 cents; malleable, over $1. Heavy melting steel on Baltimore & Ohio Railroad list was allocated at around $42, but rails and specialties were awarded at $1 to $2 above former price levels. Results of bids on Pennsylvania Railroad list were not available up until last week. The entire scrap market tone is bullish, based on the opinion of some observers that the mills sooner or later will have to re-enter the market for substantial tonnages despite the relatively favorable current stock position and fact that substantial tonnages are being returned from customers.

Buffalo — Strength continues to dominate the scrap market as another leading mill consumer placed orders for additional tonnage of No. 2 heavy melting and bundles at the prevailing range of $37 to $38 a ton. Despite the underlying firmness, mills are reported joining in a move to check abnormal price swings. Dealers report difficulty obtaining No. 1 heavy melting.

Prices on turnings jumped another dollar. Machine shop offerings reached $31.50 to $32.50 while short shoveling material was quoted at $32.50 to $33.50 here and about $2 higher at Niagara Falls. Turnings are scarce in the open market as leading automotive plants are turning in their supplies on conversion deals with mills.

Cleveland—Scrap prices in this district are holding steady on the basis of $38 to $38.50 for heavy melting steel. While one small consumer offered a premium recently for steelmaking grades it was flooded with scrap, with a result that company is out of the market. The big consumers are refusing to go above the established market price. Foundry grades are showing considerable strength as the proportion of scrap in melts is increased to offset the pig iron shortage which to a considerable degree is the outgrowth of the railroad strike some weeks ago at Pittsburgh.

Recent suggestions that the scrap market might be stabilized by curtailing some open hearths this winter are not seen meeting with customers' or the government's approval.

Chicago — Despite somewhat higher scrap prices in the East, the market here continues steady for steelmaking grades. Offering price of mills is being held firm at $39 a ton, delivered consumer, and sellers show no disposition to make long-term contracts under present conditions. Consumers report shipments at relatively good volume and each week are able to lay down small inventory.

A purchase of short shoveling turnings and cast iron borings has raised the level of the former by $2.50 a ton and the latter by $1.50. Railroad grades hold to their recent strength.

War Assets Administration took sealed bids Oct. 17 on four lots of scrap totaling 3500 tons, resulting from disposal of component parts of 37 and 120-millimeter gun mounts. The material is located at warehouse 21, Gary, Ind., and original cost to the government is said to be $12 million. Bids will be opened Oct. 23.

Cincinnati — Scrap prices broke through previous levels, for an advance of $1 here last week. The strong undertone continues in spite of the desultory nature of mill buying, so designed in an effort to avoid another price rise. District melters are fairly well supplied but brokers and dealers insist that the visible tonnage will be short of needs for the winter, at the present rate of steelmaking and foundry demands.

Washington — Department of the Army headquarters says that the Japanese naval vessels to be sold shortly for scrap will yield only about 10,000 tons of ferrous material. The ships will be sold with the stipulation that the scrap must be shipped to the United States. While no date for the sale yet has been set, interested parties can get particulars by addressing an inquiry to the Commanding General, Eighth Army, APO 343, San Francisco. Headquarters of the Eighth Army at present are in Yokohama.

Birmingham — Scrap prices show a marked tendency to increase again despite the fact that the supply situation generally is considered satisfactory. Quoted prices do not mean a great deal, especially in heavy melting and cast grades which move at premiums from time to time.

St. Louis — Scrap market has a strong price tone, with brokers awaiting developments from declining shipments on this month's lower-priced orders. High-priced orders have been expiring the last several weeks, on which deliveries are good. But if present downward trend on shipments continues, a substantial price rise is in prospect, especially since mill reserves are dropping. Scrap from remote points determines supply and, hence, price in this district to an unusual extent, because industrial scrap supplies remain at a relatively fixed volume and largely are earmarked for return to the producing mill. A favorable factor is that remote points are showing little disposition to hold off for higher prices, feeling levels already are too high to risk speculation. If a seasonal decline in shipments materializes, melters fear prices may rise to new record highs. The price effect of short supplies was seen here last week in railroad scrap, when a single

SHEAR IT CLEVERLY WITH A
BEVERLY
THROATLESS SHEAR
●Handles intricate cuts easily. No distortion. Unusually strong and durable, geared to give great power with little effort. Metal can turn any direction while cutting.
●Machines available for 14 ga., 10 ga., and 3/16 in. material.
Write for folder today!
B-3 SHEAR has ballbearing hold down and H.C.H.C. Blades
BEVERLY SHEAR MFG. CO.
3011 West 111th St.
Chicago 43, Ill.

carload of malleable from the New York Central sent quotations from $55 to $60. Chicago, Burlington & Quincy got $60 for a small offering.

Seattle — While rolling mills are receiving steel scrap in volume equal to consumption, the overall situation remains tough and inventories are not being stocked in anticipation of reduced shipments during the winter. For the present, plants are holding their own and viewing with hope the increased tempo in the ship breaking field. More surplus ships are being sold and ship breaking plants are showing greater efficiency and increased production. Prices remain unchanged at $22, fob mill, for heavy melting with outside point prices adjusted to freight charges.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 143

Pittsburgh—No immediate revision in base prices for fasteners is indicated as result of recent increase in rail freight rates. However, it is pointed out that producers have been forced to absorb substantial increase in freight charges in meeting competition, amounting to over 150 per cent on some less-than-carload shipments. In some instances, truck rates are less than rail for carload quantities.

Most producers note a slight easing in demand for fasteners, reflecting effort on part of customers to balance inventories in accordance to projected production schedules. Deliveries are extended 6 to 8 months for sizes under 1/4-inch; heavier bolts are available in 3 to 4 months. Small cold-heading wire items continue in very tight supply.

Rails, Cars . . .

Track Material Prices, Page 143

Pittsburgh — Steel producers contend they have more than lived up to their commitments in supplying 210,000 tons of steel monthly to carbuilders for the augmented freight car construction program and repairs to worn out equipment; that it is not their responsibility to police the end use to which this steel is used. In this connection it is said that substantial tonnage of steel undoubtedly has been channeled into other purposes than for the domestic freight car program.

New Power Project in West To Take 16,000 tons of Steel

Seattle — Bids for one of the major public works projects will be called about Jan. 1 by the Bureau of Reclamation, Denver, according to W. R. Young, chief engineer. This work involves construction of the Hungry Horse dam and power plant, Flathead river, Mont. The dam is concrete arch type, 520 feet high, 2000 feet in length. The power plant will house four 75,000 kilowatt generators. The project involves concrete spillway and diversion channel. Quantities total 16,000 tons of steel as follows: Concrete bars, 7150 tons; shapes, 3350 tons, including traveling and gantry cranes; metal tubing for cooling system and grouting joints, 2505 tons; plates, for penstock, etc., 2700 tons; miscellaneous metal, 275 tons

This is how STROM BALLS are born

A heading machine cutting sections from heated steel rods and compressing them in a die to a rough spherical shape.

The steel is carefully chosen and inspected, even before it gets to the heading machine. After being "born" here, balls are carefully "brought up," through a long series of grinding and lapping operations, to the unbelievably high standards of finish, sphericity and precision which have made Strom Metal Balls the standard of Industry. Strom Steel Ball Co., 1850 South 54th Avenue, Cicero 50, Illinois.

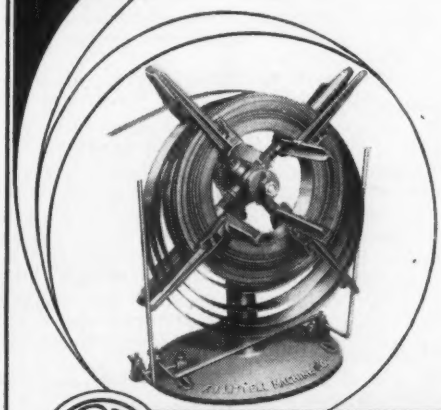
Strom BALLS Serve Industry

Largest Independent and Exclusive Metal Ball Manufacturer

LITTELL AUTOMATIC CENTERING REELS

Cut Coil Costs

LITTELL Reels, Cradles, Winders, Feeders —are unexcelled in handling coil stock. They save time. One coil, hundreds of feet long, feeding steadily instead of dozens of short strips. They save material. A continuous ribbon. Economical dovetailing of blanks thruout entire length of coil.



Easy-running, ball-bearing, self-centering, adjustable stock supports—are among the features of Littell Reels. Plain or motor-driven Reels. Coil capacities up to 6,000 lbs. Cradles for coils up to 20,000 lbs. x 72" wide.

Request Bulletins

SPEED WITH SAFETY

F. J. LITTELL MACHINE CO.

4165 RAVENSWOOD AVE., CHICAGO 13, ILL.

Canada . . .

Toronto, Ont. — Production of primary shapes by Canadian steel mills in July amounted to 228,844 net tons, including 220,044 tons of carbon steel shapes and 8800 tons of alloy steel shapes, which compares with 253,869 tons in June, including 244,117 tons of carbon steel and 9752 tons of alloyed steel shapes, and with 127,575 tons, including 123,867 tons of carbon steel and 3708 tons of alloy shapes made in July, 1946.

Shipments of primary iron and steel shapes in July totaled 167,498 net tons compared with 188,655 net tons in June and 101,799 tons in July, 1946. Shapes used as producers' interchange in July amounted to 57,258 tons; for June, 70,478 tons; for July, 1946, 24,964 tons. The big increase in production and shipments for July this year against those for the corresponding month of 1946 is due to the fact that strikes at Canadian steel plants in July last year seriously affected production schedules of the basic steel mills.

Shipments of primary iron and steel shapes in July included 14,659 tons of semifinished shapes, 7049 tons of structurals, 14,174 tons of plates, 14,357 tons of rails, 34,915 tons of hot-rolled bars, 10,733 tons of pipes and tubes, 16,856 tons of wire rods, 18,072 tons of black sheets, 7264 tons of galvanized sheets, 394 tons of tool steel, 5580 tons of castings, and 23,445 tons of other shapes.

Of the amount shipped for sale during July, 30,539 tons went directly to railways and railway car shops; 8123 tons to pressing, forming and stamping plants; 18,808 tons to merchant trade products; 19,431 tons to building construction; 14,252 tons to the containers industry; 4578 tons to agricultural equipment; 9644 tons to the automotive industry; 11,264 tons to machinery plants; 3101 tons to shipbuilding; 5112 tons to mining, lumber, etc., and 3297 tons to miscellaneous industries. Wholesalers and warehousing accounted for 22,259 tons and exports for 17,090 tons.

While pig iron production in Canada in August rose almost 4 per cent over the month immediately preceding, output of steel ingots and castings showed only a fractional gain. In both instances, however, production for August this year was well ahead of that for 1946 when output was severely reduced owing to labor troubles which closed two of the major steel mills in Canada and cut output of the other to less than 60 per cent of rated capacity.

During August pig iron output totaled 166,878 net tons or 72.9 per cent of total rated capacity and compares with 68.7 per cent for July. Production of steel ingots and castings for August amounted to 233,753 net tons or 79 per cent against 78.6 per cent for July.

Pig iron production in August included 133,827 tons of basic iron of which 122,780 tons were for further use of producing firms and 11,047 tons for sale; 19,806 tons of foundry iron of which 317 tons were for further use and 19,489 tons for sale, and 13,245 tons of malleable iron, all for sale.

Steel production in August included 226,180 tons of steel ingots and 7574 tons of steel castings.

Following are comparative production figures in net tons:

	Steel Ingots Castings	Pig Iron	Ferroalloys
Aug., 1947 ...	233,754	166,878	11,398
July, 1947 ...	232,341	157,153	12,402
Aug., 1946 ...	88,729	46,494	6,013
8 Mos., 1947..	1,949,376	1,297,184	101,550
8 Mos., 1946..	1,674,282	986,989	81,247
8 Mos., 1945..	2,049,707	1,232,162	130,090

Engineering Symposium To Feature AISC Program

American Institute of Steel Construction will hold its 25th annual convention at Miami Beach, Fla., Nov. 10-13. Featured on the program will be an engineering symposium by engineering staff members and guest architects and engineers. In addition to addresses by institute officials, the following are scheduled: "Some Guideposts for Business Planning in 1948" by Murray Shields, vice president, Bank of Manhattan, New York; "Fasteners for the Fabricating Industry" by Herman H. Lind, president, American Institute of Bolt, Nut & Rivet Manufacturers, Cleveland; and "The Building Industry—Present and Future" by Douglas Whitlock, chairman, Building Products Institute, Washington.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2500 tons, freight terminal, New York Port Authority, for erection in Newark, N. J., to Harris Structural Steel Corp., New York.

500 tons, plant, Sperry Products Inc., Danbury, Conn., through Fletcher Thompson Co., Bridgeport, Conn., to Lehigh Structural Steel Co., Allentown, Pa.

420 tons, bearing piling, grain elevator, Swift & Co., Champaign, Ill., to Carnegie-Illinois Steel Corp., Chicago; FitzSimons & Connell Dredge & Dock Co., Chicago, contractor.

300 tons, barker plant and storehouse for Weyerhaeuser Timber Co., Longview, Wash., to Isaacson Iron Works, Seattle.

240 tons, manufacturing building, Bell & Gossett Co., Morton Grove, Ill., to Wendnagel & Co., Chicago.

165 tons, laboratory and boiler room, Cities Service Oil Co., East Chicago, Ind.

150 tons, state bridge, Uniata county, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, garage for Scarf Motors Co., Auburn, Wash., to Leckenby Structural Steel Co., Seattle.

100 tons, bridge, Gilbert Ave., New Haven, Conn., to Phoenix Bridge Co., Phoenixville, Pa.

STRUCTURAL STEEL PENDING

2500 tons, Kings County Hospital, Brooklyn, Tully & DiNapoli, low on general contract.

1700 tons, Dupont Circle underpass, Washington, D. C.; bids Nov. 13, district commissioners. Project also requires 1040 tons, reinforcing bars and 18 tons, wrought iron.

1500 tons, hangars, Southwest Municipal Airport, Philadelphia; Hughes-Foulkrod Co., that city, recently noted as low, has been awarded general contract.

800 tons, Public School No. 176, New York city, bids asked.

475 tons, laboratory, Pure Oil Co., Crystal Lake, Ill.; Stone & Webster Engineering Corp., Boston, contractor-engineer.

325 tons, state bridges, New Hampshire; bids in.

300 tons, state bridges, Connecticut; bids in.

270 tons, state bridge work, near Iselin, N. J.; American Bridge Co., Pittsburgh, low.

210 tons, foundation work, municipal bridge, Penrose Ave., Philadelphia; Foley Bros., that city, low on general contract for work including coffer dams, etc.

165 tons, state bridge, Blackstone, Mass.

155 tons, state bridge, North Adams, Mass.

150 tons, state bridge, Peabody, Mass.

140 tons, also 55 tons reinforcing bars, state overhead span, etc., Okanogan county, Washington; bids to Olympia, Oct. 28.

135 tons, state bridge, Lycoming county, Pa.; bids Oct. 24.

100 tons, municipal bridge, Walnut Lane, Philadelphia; bids Oct. 30.

100 tons, telephone exchange structure, Yakima, Wash.; bids in Oct. 10.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, University of Washington medical-dental center, to Northwest Steel Rolling Mills Inc., Seattle; Boespflug Construction Co., Seattle, general contractor.

900 tons, administration building, Bow Lake airport, Seattle-Tacoma, to Bethlehem Pacific Coast Steel Corp., Seattle; Lease & Leighland, Seattle, general contractors, low $2,190,025.

850 tons, cleaning house and storage silos, National Milling Co., Ironville, O., to Carnegie-Illinois Steel Corp., Pittsburgh.

300 tons, tuberculosis hospital, Selah, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; General Construction Co., Seattle, contractors.

170 tons, Edison school, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle.

150 tons, state overspan, Yakima county, Wash., to Northwest Steel Rolling Mills Inc., Seattle; M. P. Munter, Seattle, general contractor.

REINFORCING BARS PENDING

300 tons, school, Edina, Minn., to United States Steel Supply Co., Minneapolis; M. Schumacher Co., Minneapolis, contractor.

144 tons, sewage treatment plant, Tomah, Wis., to Joseph T. Ryerson & Son Inc., Chicago; Central States Engineering Co., Oshkosh, Wis., contractor.

155 tons, sewage plant, Worcester, Mass., to Concrete Steel Co., Boston.

150 tons, lock No. 2, Pearl river, Mississippi-Louisiana; bids Nov. 25, U. S. engineer, Mobile, Ala.; work also takes 117 tons, miscellaneous steel; 59,000 square feet, steel sheet piling; 29 tons, steel castings and 71 tons, steel forgings.

105 tons, garage, Coca Cola Co., Lynn, Mass., to Northern Steel Co., Boston.

Unstated, Bureau of Roads bridge, Twisp river, Washington; Henry Hagman, Cashmere, Wash., low, $50,548.

Unstated, warehouse for Puget Sound News Co., Seattle; bids in Oct. 15.

PLATES . . .

PLATES PLACED

250 tons, 9000 foot, ¼-in. 20-in. diameter steel enamel water pipe for Walla Walla, Wash., to Hydraulic Supply Mfg. Co., Seattle.

Unstated, two water reservoirs for Grand Coulee, Wash., to Pacific Bridge Co., San Francisco, low $53,500.

RAILS, CARS . . .

RAILROAD CARS PLACED

Atlantic Coast Line, 500 high side and 300 low side gondolas, to Pullman-Standard Car Mfg. Co., Chicago.

Chicago, Indianapolis & Louisville, 100 box cars to Pressed Steel Car Co., Pittsburgh.

Lehigh & New England, 100 seventy-ton covered hopper cars, to American Car & Foundry Co., New York.

RAILROAD CARS PENDING

Atlantic Coast Line, closed on 1000 fifty-ton hopper cars, 800 box cars, 100 phosphate cars, 200 pulp wood cars and 60 seventy-ton hopper cars.

UNIT 357 Mobile Crane

- *It's Self-Propelled*
- *It Rides on Rubber*
- *It Has 1001 Uses!*

5 TON CAPACITY— 7 TON WITH OUTRIGGERS

UNIT 357 Clamshell unloading sand.

Fast, versatile industrial crane with plenty of LIFT ability . . . ideal for moving castings, steel, scrap, coal, lumber or even machine tools. Travels anywhere . . . on paved surfaces, cinders or just plain mud . . . gets there in a hurry. Available with crane hook, clamshell, o. mag.. . . quickly convertible to any other attachment. *Operated by ONE man* . . . powered by ONE engine . . . controlled from ONE position in cab.

**Features include: *Hydraulic steering . . . Air-actuated hydraulic brakes . . . One-piece cast gear case completely encloses and oil-seals all working parts. FULL VISION CAB*, pioneered by UNIT, provides 360° visibility for greater safety and efficiency.

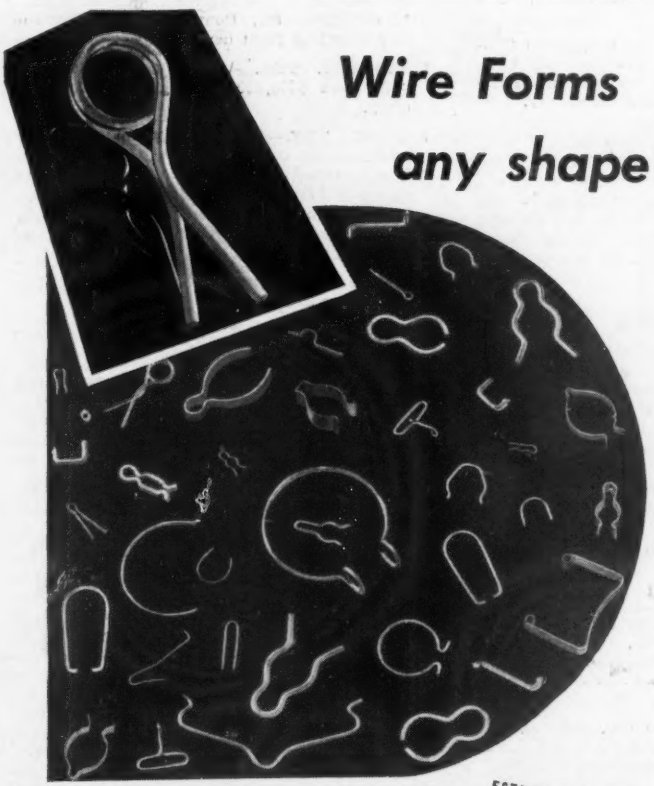
UNIT 357 Magnet used in loading scrap metal.

UNIT 357 Crane lifting bar stock.

CONTACT FACTORY DIRECT
FOR PRICE AND DELIVERY
or See Your Dealer

UNIT CRANE & SHOVEL CORP. 6521 WEST BURNHAM STREET MILWAUKEE 14, WIS., U.S.A.

A 5073-½HA-R

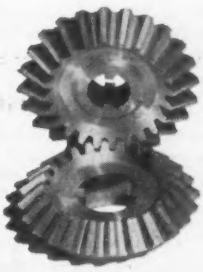


Wire Forms any shape

M. D. HUBBARD SPRING CO.
SPRINGS · STAMPINGS · WIRE FORMS
WASHERS · COTTERS · EXPANSION PLUGS
ESTABLISHED 1905 HUBBARD
425 CENTRAL AVE. PONTIAC 12, MICH.

D.O.James GEARS For INDUSTRY

SINCE 1888 . . . We have been making many types and sizes of gears for industry. Vast plant facilities of the most modern gear cutting equipment assure capable handling of your *production* or *special* gear requirements.



HELICAL and BEVEL GEARS—From 1" to 60" in diameter and from 24 DP to 1½ DP.
SPUR GEARS—Size range from ¾" to 150" in diameter. 32 DP to ¾ DP.
HERRINGBONE GEARS—Made from 1" to 60" in diameter and from 10 DP to 1½ DP.
SPIRAL BEVEL GEARS—Made from 1" to 30" in diam. and 24 DP to 1½ DP.
WORM GEARS — Made from 1" to 100" in diam. and from 24 DP to 1 DP.

YOUR GEAR INQUIRIES WILL RECEIVE IMMEDIATE ATTENTION
D.O.JAMES MANUFACTURING COMPANY
1140 W. MONROE ST. • CHICAGO, ILL.

CONSTRUCTION AND ENTERPRISE

ALABAMA

MOBILE, ALA.—National Gypsum Co., Buffalo, has let a $150,000 contract to Blaw-Knox Construction Co., Pittsburgh, for erection of a factory addition. Engineers are N. Colebank and E. L. Niederhoffer.

ARKANSAS

ST. FRANCIS, ARK. — Arkansas-Missouri Power Co., Blytheville, will build a $5 million power plant near here.

CALIFORNIA

BEVERLY HILLS, CALIF.—Pacific Telephone & Telegraph Co. has awarded a $150,000 contract to Beyer & Abrahamson, 319 Ninth & Hill Bldg., Los Angeles, for construction of an addition to the building at 490 Foothill Rd.

EL CAJON, CALIF.—Pacific Telephone & Telegraph Co. has awarded a contract to H. H. Peterson, 3340 Harasthy St., San Diego, for construction of a 1-story telephone building to cost about $500,000, including equipment.

LOS ANGELES—Wilhelm Steel Construction Co. has been incorporated with a capital of $300,000 by Charles W. Wilhelm, 9416 S. Denker Ave., and others.

LOS ANGELES—General Petroleum Corp. has awarded P. J. Walker Co., 3900 Whiteside Ave., the contract for erection of a 13-story office building. Steel work will cost $1 million.

LOS ANGELES—R.A.M. Inc. has been formed with a capital of $200,000 to conduct research and development in connection with metal products, by Frederick B. McCullough and others. Firm is represented by Andrew J. Copp Jr., 607 S. Hill St.

LOS ANGELES—Southwest Cutlery & Mfg. Co. has been formed by Walter E. Lewis, 1700 Colegrove Ave., and others with a capital of $100,000.

LOS ANGELES—Western Steel Cutting Co. Inc. has been formed with a capital of $100,000 to manufacture and deal in steel, steel scrap, iron, manganese, copper and ores by Rudolph Pacht and associates. Firm is represented by Pacht, Warne, Ross & Bernhard, 9700 Wilshire Blvd., Beverly Hills.

LOS ANGELES—Machine-Craft Mfg. Co. has been incorporated with a capital of $500,000 to manufacture and deal in electrical mixers, equipment and machinery by Thomas Graning, 601 E. Bonita Ave., Azusa, and associates.

SAN JOSE, CALIF.—General Electric Co., 230 Montgomery St., San Francisco, has awarded a contract to Judson-Pacific-Murphy Corp., 1200 17th St., San Francisco, for the construction of a motor factory. Cost will be about $140,000.

SANTA CLARA, CALIF.—Owens-Corning Fiberglas Corp., 1500 Nicholas Bldg., Toledo, O., has awarded a contract to Bechtel Construction Co., 20 Bush St., San Francisco, for the erection of the first unit of a manufacturing plant. Cost will be about $550,000.

COLORADO

DENVER—Bay Petroleum Corp., Midland Savings Bldg., plans to increase its gasoline refinery capacity at a cost of $900,000.

CONNECTICUT

BRIDGEPORT, CONN.—Bridgeport Gas Light Co., 815 Main St., plans to build a $1,250,000 gas storage tank on Housatonic Ave. Tank will have a capacity of 5 million cu ft.

HARTFORD, CONN.—Veeder Root Inc., 20 Sargent St., has awarded a $350,000 contract to H. Wales Lines Co., 134 State St., Meriden, for construction of a 1-story factory expansion on Homestead Ave.

NEW HAVEN, CONN.— New York, New Haven & Hartford Railroad, E. E. Oviatt, chief engineer, Yellow Bldg., has awarded a $200,000 contract to J. W. Bishop Co., Foster St., Worcester, Mass., for construction of a storage building on Hallock Ave.

ILLINOIS

CHICAGO—Englander Co., 2447 Roosevelt Rd., has awarded a $200,000 contract to Paschen Contractors, 2739 Elston Ave., for the erection of a factory.

INDIANA

MARION, IND.—Crosley Motors Co. proposes to build a $650,000 plant expansion, including a finishing department.

TERRE HAUTE, IND.—Visking Corp., Gustav Freund, divisional manager, Preston and N. Fifth Sts., plans to build a $500,000 factory at 34th St. and Ft. Harrison Rd.

LOUISIANA

CHURCH POINT, LA.—Anchor Gasoline Corp., Atlas Life Bldg., Tulsa, Okla., plans to build a $210,000 extracting distillate gas plant. Chief engineer is J. R. Wright.

MARYLAND

BALTIMORE—American Oil Co., American Bldg., plans to build a 1-story engine test laboratory on Cherry Hill Lane at a cost of $100,000. Engineer is George E. Blatchley, 1112 American Bldg.

SPARROWS POINT, MD.—Bethlehem Steel Co. has plans completed for a $193,000 project here to include a fuel oil storage building, chimney No. 8 for coke ovens, a railroad bridge and tracks, 19 towers and a fuel oil tank.

MICHIGAN

BAY CITY, MICH.—Electric Auto-Lite Co. has awarded a $500,000 contract to Henry C. Webber Construction Co. for erection of a 1-story factory addition.

DETROIT—Godin Tool & Die Co., 20580 Hoover Ave., has been formed by Arthur F. Godin with a capital of $500,000 to manufacture tools, dies, jigs and machinery.

NEW JERSEY

ENGLEWOOD, N. J.—Ervan Lucas Bols Inc., c/o Walter M. Cory, architect, 28-29 41st Ave., Long Island City, N. Y., has awarded $250,000 contract to Honeck Realty Corp., 110 Main St., Hackensack, for the construction of a plant.

NEW YORK

TONAWANDA, N. Y.—Martin Fireproofing Co. plans to build a $150,000 plant here. Syracuse Supply Co. will also construct a factory here costing a similar amount.

NORTH DAKOTA

GRAND FORKS, N. D.—North Dakota Mill & Elevator Co. has awarded a $200,000 contract to Northern Construction Co., 509 S. Third St., for erection of 24 grain tanks.

OHIO

CINCINNATI — Hilton-Davis Chemical Co., 2235 Langdon Farm Rd., has awarded a $132,000 contract to Holt & Reichard Construction Co., 12 E. McMillan St., for erection of a chemical plant.

CLEVELAND—Betz-Pierce Co., 1284 E. 53rd St., has completed plans for a 2-story warehouse and office addition costing $115,000.

SALEM, O.—E. W. Bliss Co., 250 Franklin Ave., plans to increase capacity of its plant here with proposed purchase of $350,000 worth of machine tools.

TOLEDO, O.—Toledo Stamping & Mfg. Co., 99 Fearing Blvd., plans to build a $100,000 plant addition. Half this expenditure will be for building, and remainder will be for equipment and machinery.

PENNSYLVANIA

HATBORO, PA.—Pennsylvania Rivet & Machine Co., Third and Huntingdon Sts., Philadelphia, plans to build a $250,000 factory here.

TENNESSEE

MEMPHIS, TENN. — General Dry Batteries Inc., c/o contractor, has awarded a $55,000 contract to Seth E. Glem, 166 Monroe Ave., for construction of a battery manufacturing plant. Architect is E. L. Harrison, 81 Madison Bldg.

TEXAS

BEAUMONT, TEX.—Gulf States Utilities Co., Roy S. Nelson, president, has awarded a $6 million contract to Stone & Webster Engineering Corp., M. Esperson Bldg., Houston, for construction of a 40,000 kw electric turbo-generating unit on Neches river near here.

DALLAS, TEX.—Churchill & Barry, Construction Bldg., plans to erect a $113,000 plant.

FORT WORTH, TEX.—American Cyanamid & Chemical Corp., c/o W. L. Spalding, manager, Sixth and N. Jones Sts., plans a $1 million plant expansion program.

HOUSTON, TEX.—Drumex Inc., D. B. Burns, vice president, 3940 Main St., plans a plant expansion program totaling $750,000, chiefly for the modernization of a drum renovating plant. Consulting engineer is Joe Dannenbaum, 3940 Main St.

HOUSTON, TEX.—National Cylinder Gas Co. 6201 Industrial Way, Chicago, contemplates a $150,000 plant expansion program.

HOUSTON, TEX.—Cook Paint & Varnish Co., 1816 Main St., has cancelled bids it received last month for a proposed $150,000 plant.

JACKSONVILLE, TEX.—Dodds Refining Co. will build a $450,000 oil refinery.

KATY, TEX.—Humble Oil & Refining Co., 1216 Main St., Houston, has awarded a $6,860,000 contract to Stearns-Rogers Mfg. Co., 17 California St., Denver, for construction of a recycling plant here.

NORDHEIM, TEX.—Wescol Oil & Gas Co. will spend $300,000 on a gas recycling facility.

SILBEE, TEX.—American Republics Corp. and Houston Oil Co., Esperson Bldg., Houston, have awarded a $3 million contract to Gasoline Plant Corp., Niels Esperson Bldg., Houston, for construction of a gas recycling plant here.

TYLER, TEX.—Texas Power & Light Co., Interurban Bldg., Dallas, will build a $110,000 power sub-station.

WEST VIRGINIA

BENWOOD, W. VA.—Wheeling Steel Corp., Wheeling Steel Bldg., Wheeling, has awarded a contract to H. L. Seabright Co., 43rd and McCulloch Sts., for the construction of a $107,000, 1-story mill.

IDAMAY, W. VA.—Industrial Collieries Corp. will spend $290,000 on 1-story mine buildings.

NITRO, W. VA.—General Chemical Co., 40 Rector St., New York, subsidiary of Allied Chemical & Dye Corp., plans acquisition of a 50-acre site here for a proposed plant, to manufacture sulfuric acid.

WISCONSIN

LA CROSSE, WIS.—Allis-Chalmers Mfg. Co., 1126 S. 70th St., West Allis, has awarded a contract to Permanent Construction Co., 4100 N. Third St., Milwaukee, for the design and construction of a 1-story plant. Architect is C. E. Meyer, c/o owner.

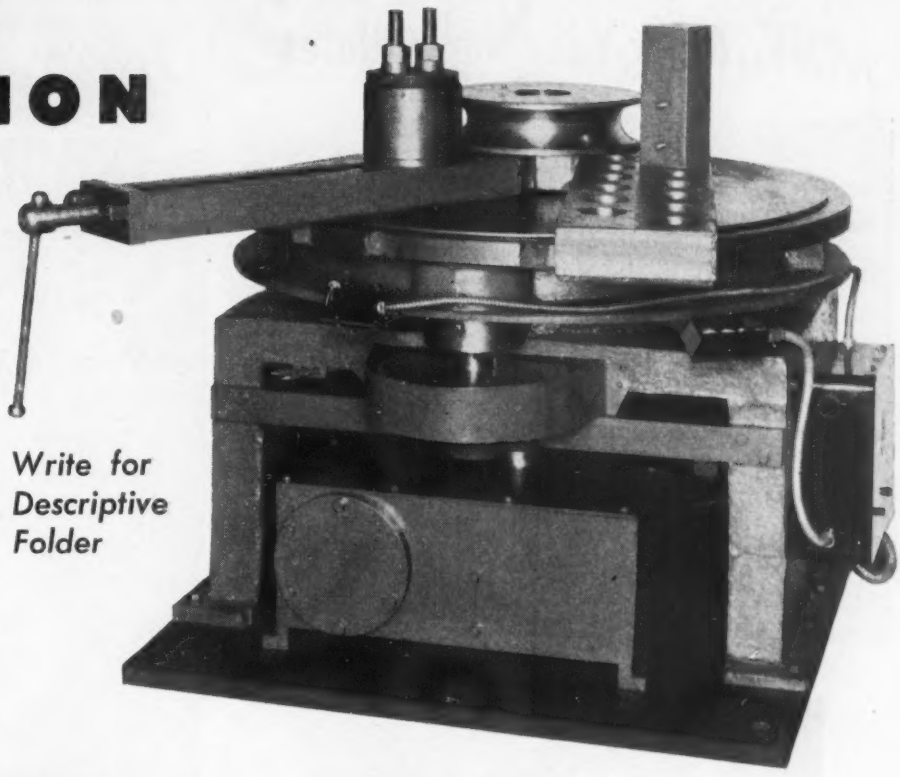
PORT WASHINGTON, WIS.—Wisconsin Electric Power Co., 231 W. Michigan St., Milwaukee, has awarded a contract to Hunzinger Construction Co., 4541 N. 124th St., Milwaukee, for the erection of a 1-story power plant addition. Estimated cost, including equipment, is $11 million.

PEDRICK PRODUCTION BENDERS

for

Pipe and Concrete Reinforcing Bars

When a production bender is used for bending reinforcing bars, a high and variable speed is very much to be desired. A four speed transmission enables this machine to bend large bars at slow speed and smaller bars at high speed, and the Pedrick feature of multiple production makes this machine a very useful addition to the contractor's equipment. The machine will make bends to any curvature up to 180° automatically without manual attention other than to load and unload the machine.



Write for Descriptive Folder

PEDRICK TOOL & MACHINE CO.

3640 N. Lawrence St., Philadelphia, 40, Pa.

---

4 BIG REASONS WHY
the Standard COULTER "HT" Thread Milling Machine
IS THE MACHINE FOR YOU!
★ Any number of Lands eccentric or con-eccentric relief can be produced. Dies from 3/8" up to 2"
★ Equipped to give cutter speeds with infinite changes from 100 RPM to 650 RPM
★ Can thread round, square and inserted chaser dies
★ The most economical of ALL threading machines
Write for Full Particulars
PRODUCTION MACHINES SINCE 1896
The James COULTER Machine Co.
BRIDGEPORT • CONNECTICUT • U.S.A.

"HERCULES" (Red Strand) Wire Rope has enjoyed an "outstanding" reputation for nearly 70 years because it has consistently rendered safe, dependable and economical service in every field of industry.

WE INVITE *YOUR* INQUIRIES

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS ESTABLISHED 1857

5909 KENNERLY AVENUE • ST. LOUIS 12, MO., U.S.A.

NEW YORK • CHICAGO • DENVER • SAN FRANCISCO • PORTLAND • SEATTLE

NOW.. Mark Your Name Plates

QUICKLY

DISTINCTLY

ECONOMICALLY

Those blank spaces on your Name Plates can be filled in quickly and economically with serial numbers, lot numbers, dates, operating data, etc., with a Matthews Name Plate Stamping machine. Your name plate—and your product—will be enhanced by the neatness with which it is done.

Stamping machines are available for efficient integration in almost any production process or technique. If your need calls for a device other than those already made, we will be glad to engineer one to meet all your requirements.

Dies for letters, numerals, special marks and designs can be supplied to your order. For detailed information, write for Supplement E.

JAS. H. MATTHEWS & CO.

3978 FORBES STREET PITTSBURGH 13, PA.

BRANCH PLANTS

NEW YORK, BOSTON, CHICAGO PHILADELPHIA, NEWARK, SYRACUSE

District Sales Offices Cleveland Cincinnati Birmingham Dallas

DIE STAMPING
CHROME PLATING
Tube Bending

FOR THE INDUSTRIAL TRADE

We are fully equipped to satisfy all of your needs in die stamping, chrome plating and tube shaping. Any size or any quantity can be handled promptly and efficiently . . . to give you the utmost in fine quality. Full automatic plating equipment for chrome as well as other types of plating. Automatic polishing equipment to give your product proper finish. Inquire about free estimates NOW.

WRITE FOR ESTIMATES

ANY QUANTITY
ANY SIZE

LOGAN PLATERS INC.

555 Main St. North Tonawanda N.Y.

PERFORATED METALS OF EVERY DESCRIPTION

Promptly made to your exact specifications. We can furnish any size or style of perforations desired.

CHICAGO PERFORATING CO.

2443 W. 24th Place Canal 1459 Chicago, Ill.

Member Metal Treating Institute

PITTSBURGH COMMERCIAL HEAT TREATING CO.

COMPLETE HEAT TREATING FACILITIES for Ferrous and Nonferrous Metals

49TH ST. & A.V.R.R. PITTSBURGH, PA.

COWLES

GANG SLITTING KNIVES

STANDARD for SERVICE and DURABILITY. Ground to extremely close Tolerances and Finish. Made by TOOLMAKERS.

COWLES TOOL COMPANY

CLEVELAND 2, OHIO

SEAMLESS
HIGH PRESSURE
GAS
CYLINDERS

FOR ALL COMPRESSED and LIQUEFIED GASES
DIAMETERS UP TO 13"

•

HOT DRAWN
FROM CARBON MANGANESE and CHROME MOLY STEELS
Carefully Made
Rigidly Inspected

•

Other TISCO Products:
MANGANESE STEEL CASTINGS • ALLOY & CARBON STEEL CASTINGS • FROGS • SWITCHES
SPECIAL TRACKWORK
MISC. SEAMLESS TUBING

SINCE 1742

TAYLOR-WHARTON IRON AND STEEL COMPANY
HIGH BRIDGE, N. J. & EASTON, PA.
Cylinder Sales Office: 110 East 42nd St. New York 17, N. Y.

mechanical
POWER PRESSES
FOR
ALL INDUSTRIES
ZEH & HAHNEMANN CO.
56 AVENUE A, NEWARK 5, N. J.

SIMONDS GEARS

SPUR • BEVEL • MITRE
WORM • WORM GEARS • RACKS

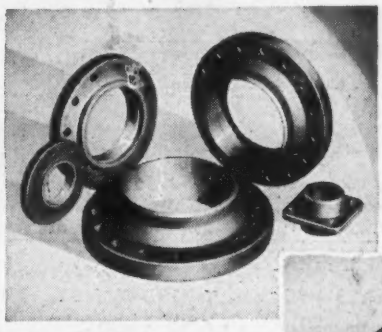
Large diameters! Heavy types—in cast or forged steel, gray iron, bronze, silent steel, rawhide or bakelite. Over 50 years' experience in quality gear making!

Stock Carrying Distributors of Ramsey Silent Chain Drives and Couplings • Emergency Service!

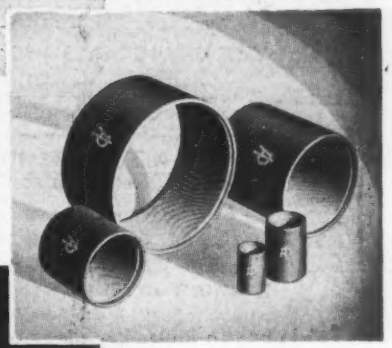
THE SIMONDS GEAR & MFG. CO.
Liberty at 25th • Pittsburgh 22, Pa.

STEEL...
with the Seal of Quality

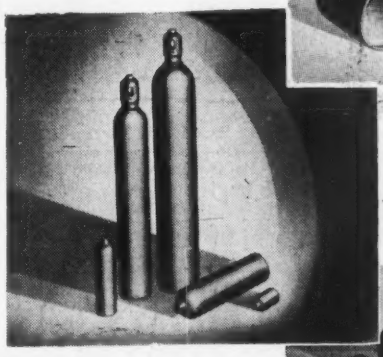
The science and "know-how" of Harrisburg craftsmanship begins with the steel . . . by selecting only the highest grade of quality steel. That is why Harrisburg enjoys a reputation for product superiority . . . wherever fine performance and durability are in demand.



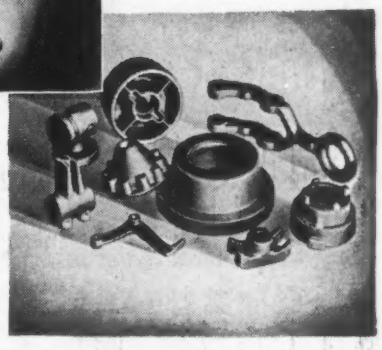
Harrisburg Drop-Forged Steel Pipe Flanges are made to A.S.A. standards and can be furnished in standard or special types to meet your exact requirements.



Harrisburg Seamless Steel Pipe Couplings are manufactured to A.P.I. specifications and are available in all sizes.



Harrisburg Seamless Steel Cylinders for high pressure gases. Available in standard or lightweight.



Harrisburg Drop and Hollow Forgings are available in all sizes, from the simplest to the most intricate designs.

HARRISBURG MANUFACTURES: Alloy and Carbon Steels Seamless Steel CO_2 Liquefiers • Pipe Couplings and High Pressure Gas Cylinders • Drop and Hollow Forgings Forged Steel Pipe Flanges

HARRISBURG
STEEL CORPORATION
HARRISBURG • PENNSYLVANIA

FURNACE ENGINEERS, INC.

FURNACES

FOR THE

STEEL INDUSTRY

F.E.I.

1551 W. LIBERTY AVE. PITTSBURGH 26, PA.

TOLEDO STAMPINGS

Let us make your stamping problems our problems. Our Engineering Department has had many years of experience in development work and our production facilities include not only a modern press department, but facilities for copper hydrogen brazing and other types of welding and assembling work. We solicit your prints and inquiries.

Toledo Stamping and Manufacturing Co.

90 Fearing Blvd. Toledo, Ohio

Detroit Office: 2970 W. Grand Boulevard, Detroit, Mich.
Chicago Office: 333 North Michigan Ave. Chicago, Ill.

The OHIO LOCOMOTIVE CRANE Co. BUCYRUS, OHIO

Pickling of Iron and Steel—*By Wallace G. Imhoff*

This book covers many phases of pickling room practice and construction and maintenance of pickling equipment.

Price Postpaid $5.00

THE PENTON PUBLISHING CO.
Book Department
1213 W. 3rd St., Cleveland 13, Ohio

520-S

Lewis TRAVEL-CUT Wire STRAIGHTENING and CUTTING MACHINES

AUTOMATIC ··· HIGH SPEED ··· HEAVY DUTY

Machines for 1/16" to 3/4" Rod. Rounds and Shapes.

THE LEWIS MACHINE CO., 3450 E. 76th St., Cleveland, Ohio

BELMONT IRON WORKS
PHILADELPHIA NEW YORK EDDYSTONE

Engineers - Contractors - Exporters

STRUCTURAL STEEL — BUILDINGS & BRIDGES

RIVETED—ARC WELDED

BELMONT INTERLOCKING CHANNEL FLOOR

Write for Catalogue

Main Office—Phila., Pa. New York Office—44 Whitehall St.

HIGH SILICON IRON. **SILVERY**

"JISCO"

ESSENTIAL FOR ALL FERROUS METALLURGY

THE JACKSON IRON & STEEL CO. · JACKSON, OHIO

MECHANICAL TUBING
PRESSURE TUBING
STAINLESS TUBING

TS TUBULAR SERVICE

AIRCRAFT TUBING
SEAMLESS STEEL PIPE
STAINLESS STEEL PIPE

TUBULAR SERVICE CORPORATION

BROOKE PIG IRON

E. & G. BROOKE IRON CO.
BIRDSBORO, PENNA.

MFGRS OF HIGH GRADE

FOUNDRY
BASIC
GREY FORGE
MALLEABLE
BESSEMER
LOW PHOS.

Steel Makers Since 1871

STRIP STEEL

STANLEY

Hot Rolled – Cold Rolled
Special Carbon – Alloys

The STANLEY WORKS

New Britain, Bridgeport, Conn.—Hamilton, Ont.

Versatility counts in

HOT DIP GALVANIZING

any size or shape product, any size

order from the smallest to the largest

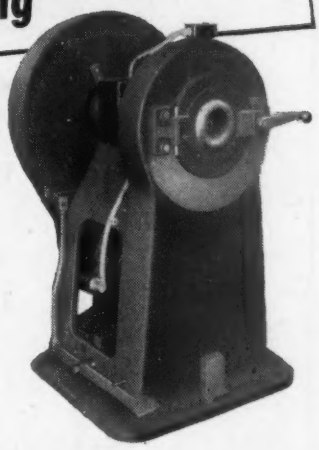
Excellent facilities for export shipment

ENTERPRISE

GALVANIZING COMPANY

2525 E. Cumberland Street Philadelphia 25, Pa.

"Standard" SWAGING MACHINES SHAPE AND JOIN METALS Without Cutting



● In one rapid operation "Standard" Swaging Machines reduce, point, and form tubing or bar stock — without loss of material. They also attach fittings to tubing, wire or cable. Parts swaged are smooth, strong and accurately sized. "Standard" Swagers have many special features for durability and fast, easy operation.

16MM SOUND FILM, *26 minutes, showing principle and applications of Swaging, offered engineering and production groups. Write for available dates.*

STANDARD MACHINERY COMPANY
1536 Elmwood Avenue • Providence 7, Rhode Island
MANUFACTURERS OF
Power Presses to 500 Tons • Rolling Mills • Swagers
Turks Heads • Steel Die Sets

Why PITTSBURGH GEARS Last Longer

"Customer's specifications" and metal alone won't produce gears that can "take it" in actual use. PITTSBURGH GEARS are a combination of these PLUS 30 years gear making "know-how" and scientific heat treating that impart working hardness, free from internal stresses. Result: Longer, economical gear life. Quotation requests invited.

PITTSBURGH GEAR AND MACHINE COMPANY | 271h & Smallman Streets PITTSBURGH 22, PA.

PIONEER PRODUCER OF QUALITY GEARS

• PICKLING TANKS •
• PLATING TANKS •
• ANODIZE TANKS •

HEATING UNITS FOR ACID TANKS

HEIL PROCESS EQUIPMENT CO.
12503 ELMWOOD AVE. CLEVELAND, OHIO

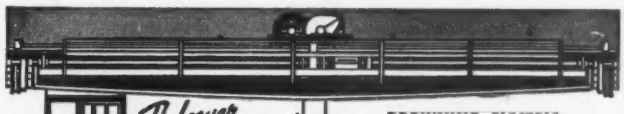
DIFFERENTIAL STEEL CAR CO., FINDLAY, OHIO

Air Dump Cars, Mine Cars, Locomotives, Lorries AXLESS Trains and Complete Haulage Systems

INDUSTRIAL TRUCKS AND TRAILERS

Caster and Fifth Wheel Types

THE OHIO GALVANIZING & MFG. CO.
Penn St., Niles, Ohio



To Lower your Overhead

BROWNING ELECTRIC TRAVELING CRANES AND HOISTS
up to 125-TON CAPACITY

VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

ERDLE PERFORATED SHEET METALS

ORNAMENTAL—INDUSTRIAL

For All Purposes
68 Years of Metal Perforating
Prompt Shipments
Send for Metal Sample Plates

THE ERDLE PERFORATING CO.
171 York Street Rochester, N.Y.

WHEELING STEEL CORPORATION
WHEELING, WEST VIRGINIA

TIN PLATE

COP-R-LOY PIPE-SHEETS

Ductillite
THE MODERN TIN PLATE

WHEELING STEEL

Quantity
PRODUCTION
of
GREY IRON CASTINGS

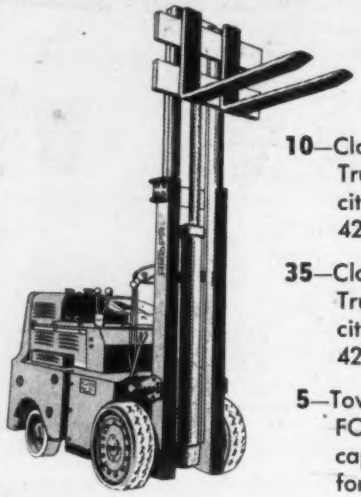
ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS
CHATTANOOGA 2, TENNESSEE

FORK LIFT TRUCKS

FOR IMMEDIATE SALE



at new LOW PRICES

10—Clark ELECTRIC FORK Trucks, 6000 lbs. capacity, 104" or 144" lift, 42" Forks

35—Clark GASOLINE FORK Trucks, 6000 lbs. capacity, 104" or 144" lift, 42" Forks

5—Towmotor GASOLINE FORK Trucks, 10,000 lbs. capacity, 72" lift 42" forks.

ALL TRUCKS ARE IN 1st CLASS CONDITION

Write, Wire or Phone

A. & A. MACHINERY
1267 Flushing Ave. Bklyn., N. Y.
EVergreen 7—9466

★ ★ **ROLL PASS DESIGN** ★ ★

By Professor W. Trinks

These two volumes and Supplement comprise a complete digest of information on theory and practice of rolling mill design, construction and operation, etc., written by the leading authority.

VOLUME ONE — Third Edition; 201 pages; 7 tables; 139 drawings; @ $5.00 Postpaid
Contents: Classification and Strength of Rolls—Basic Principles Governing Entrance and Deformation—Various Principles Underlying the Process of Rolling

VOLUME TWO — Second Edition; 246 pages; 7 charts; 176 drawings; @ $6.00 Postpaid
Contents: Rolling of Square or Nearly Square Sections—Rolls for Flat Sections—Rolls for Merchant Bar—Rolling of Shapes—Die Rolling—Roll Mill Torque—Rolling of Nonferrous Metals—Roll Passes for Seamless Tubes

SUPPLEMENT — First Edition; 84 pages; 61 drawings; @ $1.50 Postpaid
New material, available since publication of Volumes One and Two, is included in this supplement. Reference is made to pages in the two volumes.

HAVE COPIES OF THESE BOOKS AVAILABLE WHEN YOU NEED THEM . . . *Order Today*

STEEL, BOOK DEPARTMENT
1213 W. 3RD ST., CLEVELAND 13, OHIO
(3% ADDITIONAL FOR ORDERS DELIVERED IN OHIO)

USED and REBUILT EQUIPMENT
MATERIALS

RAILS NEW AND RELAYING

TRACK ACCESSORIES

from **5** *Warehouses*

- PROMPT SHIPMENTS
- FABRICATING FACILITIES
- TRACKAGE SPECIALISTS

EVERYTHING FROM ONE SOURCE

L. B. FOSTER COMPANY

PITTSBURGH CHICAGO
NEW YORK SAN FRANCISCO

FOR SALE

5—27" WF Beams 145# 80'
4—30" WF Beams 172# 80'

KLINE IRON & METAL COMPANY

P. O. Box 1013, Columbia, S. C.
Telephones 4-1464 and 3670

RAIL
STEEL PLATE
STRUCTURALS, PIPE,
TUBING, WIRE ROPE,
FERROUS AND NON-FERROUS SCRAP

BOUGHT-SOLD
LIQUIDATED

DULIEN STEEL PRODUCTS, Inc.
of Washington
9265 E. Marginal Way • Seattle 8, Wash. • LAnder 6000

TWO ROTARY CONVERTERS, excellent condition, Allis-Chalmers make, Bullock type, Volts full load 600/DC, 25 cycle, 1667 amps, 300 R.P.M.

TWO TRANSFORMERS, excellent condition, Westinghouse make, 900 KVA.

TWO MOTORS, on Rotary Converters, excellent condition, 200 H.P., 370 Volts, 25 cycle, 375 R.P.M., Allis-Chalmers make.

SWITCHBOARD, PANELS, ETC. from Discontinued Power House.

MILLER JUNK & WASTE CO.

So. Prince & Hazel Sts. Lancaster, Pa.

New RAILS Relayers

All sizes and weights. Also frogs, switches, spikes, bolts, tie plates, contractors' and mill equipment carried in stock.

480 Lexington Ave., New York, N. Y. M. K. FRANK Stack Bldg. Reno, Nev. Park Bldg. Pittsburgh, Pa. Carnegie, Pa.

OVERHEAD CRANES

1-TON
Curtis 24' Span
Detroit 10' Span
Detroit 18'6" Span
Cleveland 38' Span
Euclid 40' Span
Shepard Niles 12' Span

2-TON
Conco 12' Span
Louden 19'2" Span
Northern 28' Span
P&H 31'10¾" Span

3-TON
Shaw 51'2" Span
Chicago Tramrail 27½' Span
P&H 37'6" Span
P&H 42'1½" Span

5-TON
Alliance 95' Span
Crane 47'3" Span
Crane 76' Span
Detroit 38'8" Span
Case 35' Span
Detroit 34' Span
Northern 32' Span
Northern 22' Span
P&H 31'10" Span
P&H 72'1" Span
Crane 37'3" Span
Crane 57'3" Span
Shepard 27' 6" Span

6-TON
Shaw 21'10½" Span

7-TON
Charging & Quenching Cranes 32' & 36' Spans

7½-TON
Northern 26'7½" Span

8-TON
P&H 80' Span

10-TON
Lane 60' Span
Cleveland 51'3" Span
2 Yd. Morgan Bucket Crane 60' Span
Shaw 67'6" Span
P&H 87'6" Span
Shaw 80'9" Span
Alliance 58'5" Span
Lane 50' Span

15-TON
Overhead Crane 74'4" Span
Outdoor Crane 57'5½" Span
Alliance 48'9½" Span
New Albany 50'6" Span
Morgan 82' Span
Northern 76' Span
P&H 40' Span
Whiting 38' Span

20-TON
Overhead Crane 60' Span
Whiting 48'6" Span
Whiting 75' Span
Shepard Niles 48'6" Span
P&H 51'4" Span
P&H 37' Span

25-TON
Alliance 38'2" Span
Bedford 67'8" Span
Case 63' Span
Overhead Crane 74'4" Span
P&H 80' Span

30-TON
Morgan 55' Span
Northern 75' Span

35-TON
Overhead Crane 74'4" Span

40-TON
Niles 151'9½" Span

50-TON
Alliance 52' Span
Morgan 50' Span

75-TON
64'8¼" Span

Telephone us collect to discuss your requirements

ECONOMY COMPANY, INC.

49 Vanderbilt Ave. New York 17, N. Y.

Telephone: Murray Hill 4-1616

For Sale

1 Model 520 INDUCTION THERMONIC GENERATOR, approximately 20 KVA, complete with Timer, Tubes, two position work table and Heat Exchangers. Made by Heat Induction Corp., used approximately six months.

1 Federal 100 KVA RESISTANCE SEAM WELDER with Weltronic control panel and new transformer.

The Ohio Can & Crown Co.
Massillon, Ohio

FOR SALE

ALLOY STEEL

ROUND, HEX, SQUARE BARS

New York and Pittsburgh Warehouse Stocks

L. B. FOSTER CO.

9 Park Place, New York 7
Phone—Barclay 7-2111
P. O. Box 1647, Pittsburgh 30
Phone—Walnut 3300

Michigan Distributor
C. J. GLASGOW COMPANY
2009 Fenkell Ave., Detroit 3
Phone—Townsend 8-1172

RELAYING RAIL

TRACK ACCESSORIES

MIDWEST STEEL CORP.

Gen'l Off. CHARLESTON 21, W. VA.
Warehouses
CHARLESTON, W. VA.
KNOXVILLE, TENN. • PORTSMOUTH, VA.

SEND FOR OUR NEW STOCK LIST

Hot & Cold Rolled Steel, Stainless, Aluminum Sheets, Strip, Coils, Rods, Tubing, Wire, etc.

SEABOARD STEEL COMPANY, INC.

New Haven, Conn.

EQUIPMENT ... MATERIALS

For Sale

GAS PRODUCERS

3—10-foot and 2—7-foot Kerpely Gas Producers, complete with waste heat boiler and all other auxiliary equipment. All in good condition.

THE LACLEDE GAS LIGHT CO.

1017 OLIVE ST. ST. LOUIS 1, MO.

Stainless Steel & Alloy

WELD ROD

Gov't surplus—new and in perfect condition

TYPE 310		
P & H size 1/8"	8,250#	20 cents/#
TYPE 307 MN		
P & H AW3C size 1/4"	14,800#	15 cents/#
Arcos Chromang size 5/32"	75,000#	15 cents/#
SW 164 size 3/16"	4,600#	15 cents/#
SW 164 size 1/8"	2,700#	15 cents/#
AWS CLASS E10020		
SW 101 size 1/4"	5,700#	.05 cents/#
SW 101 size 3/16"	5,250#	.05 cents/#

F.O.B. our plant Terms: Cash with Order

STAINLESS FOUNDRY & ENGINEERING CO.

5132 N. 35th St. Milwaukee 9, Wis.

Wanted—SHEARINGS

Any Amount—All Sizes, Galvanized, Cold and Hot Rolled Aluminum—Stainless and Copper. 6" Minimum Width to 36" Minimum Length. Uniform Quantities. Gauges from 16 to 30 inclusive.

Write or Wire

Los Angeles Sheet Metal Mfg. Co.

901-903 E. 9th St. Los Angeles 21, Calif.

TRinity 4713

Wanted

2500 1 ft. Spiral or butt weld 10-gauge pipe or tubing in 7", 8" or 9" O.D.

Contact Keystone Trailer & Equipment Co.

P. O. Box 169 Kansas City 10, Mo.

Wanted to Buy

Any quantity of 3/4" x 3/4" x 1/8" T's, or 7/8" x 7/8" x 1/8" T's, or 1" x 1" x 1/8" T's.

GOODCRAFT METAL PRODUCTS CO.

2526 Fifth St. Detroit 1, Mich.

Use This Section

When you have machinery or equipment you want to sell—STEEL can help you. For rates, write STEEL, Penton Bldg., Cleveland.

CLASSIFIED

Accounts Wanted

A reliable Chicago area Engineering, Designing, and Sales Organization wants to represent high quality manufacturers in

Sheet and Plate Fabrication
Structural Fabrication
Machine Shop
Stamping Shop

We have a competent staff of Engineers to service all of the above categories, and in addition, we have many fine contacts in the above manufacturing businesses.

Address Box 224,

STEEL, 520 N. Michigan Ave., Chicago 11, Ill.

Accounts Wanted

AGENT

(Located Milwaukee covering Wisconsin and Upper Michigan)

Now representing tool and screw machine products accounts, equipped to handle allied lines in steel industry. We can help you in markets growing increasingly more competitive.

Write Box 234,
STEEL, Penton Bldg., Cleveland 13, O.

MANUFACTURERS' REPRESENTATIVE 20 years' experience selling industrials in state of Indiana desires additional exclusive line. Commission basis. Address Box 207, STEEL, Penton Bldg., Cleveland 13, O.

Positions Wanted

WORKS MANAGER—EXECUTIVE ENGINEER

Broad successful industrial experiences in all phases of modern plant management in U.S.A. and Europe, seeks permanent connection with a live wire organization. Salary $15,000.00 — Please state your requirements. Excellent references.

Write Box 188,
STEEL, Penton Bldg., Cleveland 13, O.

SUPERVISORY POSITION WANTED IN ROD or merchant mill by man with 12 years' experience as general foreman and rolling mill superintendent, rolling rods, flats and shapes of all grades of steel and alloys. Experienced in roll and pass design. Free to relocate. Can furnish good references. Write Box 235, STEEL, Penton Bldg., Cleveland 13, O.

CLASSIFIED

Help Wanted

Wanted at Once

TWO STEEL MILL SUPERINTENDENTS

For west coast steel mill. Must have thorough production experience. Permanent position—good salary. Excellent opportunity for qualified men. Write full details and past work history to Box 212, STEEL, Penton Bldg., Cleveland 13, O. Confidential.

ROLLING MILL SUPERINTENDENT. AN UNusual opportunity is available for an able, experienced engineering executive for a mill rolling special alloys such as stainless steel. Thorough understanding of, and experience in the operation and maintenance of electrical and mechanical equipment is, of course, essential. Additionally, the man selected will be one who has a real record of successful personnel administration, including the selection and training of mill crews. Your reply will be held in the strictest confidence. It should cover fully, education, background and experience, and all other details that will make it possible to consider the initial application thoroughly. Address Box 225, STEEL, Penton Bldg., Cleveland 13, O.

WANTED: GENERAL SUPERINTENDENT not over 38 years old. Must be a willing hard worker, capable and experienced in the construction of all types of API-ASME Code pressure vessels. Must be able to assume complete responsibility of operating a plant of 200 or more employes, including night shift, have thorough knowledge of all manufacturing procedures, modern production methods, plant layout, planning and meeting production schedules, labor estimating, maintenance and capable of maintaining budget and burden figuring in relation to plant operations to achieve the lowest operating costs possible and be a leader of other men. Write Box 211, STEEL, Penton Bldg., Cleveland 13, O.

Wanted

PLATE AND TANK SALES ENGINEER

Must be experienced designer and estimator, familiar with pressure and code work. Excellent opportunity for aggressive, ingenious young engineer. Give full information and references first letter. Write Box 232, STEEL, Penton Bldg., Cleveland 13, O.

STRUCTURAL STEEL DETAILERS & CHECKERS

Must be thoroughly experienced
49 Hrs Weekly

CARNEY & ASSOCIATES, LTD.

824 Hamilton St. Allentown, Pa.

PERMANENT POSITION FOR GRADUATE Engineer. Structural Steel and Light Iron Estimator. Some structural design experience desirable. Plant in Eastern Pennsylvania. Write Box 120, STEEL, Penton Bldg., Cleveland 13, O.

WANTED: MACHINE DESIGNERS AND Checkers for steel mill machinery. Only experienced responsible men need apply. Salary open. Write The Aetna-Standard Engineering Co., Home Savings & Loan Bldg., Youngstown, Ohio.

WANTED: ENGINEER DRAFTSMEN FOR Mechanical, Structural and Foundation Work. Blast Furnace and Steel Plant. Experience Preferred But Not Essential. Address: P.O. Box 216, Buffalo, New York.

Help Wanted

SALES MANAGER

Established steel mill needs an executive with proven ability and background in sales management. Prior experience with hot rolled mill products essential. Salary will be commensurate with ability. Write full particulars to Box 213, STEEL, Penton Bldg., Cleveland 13, O. Confidential.

Employment Service

SALARIED POSITIONS $2,500-$25,000. THIS thoroughly organized confidential service of 37 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated through a procedure individualized to each client's requirements. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details. R. W. BIXBY, Inc., 110 Dun Bldg., Buffalo 2, N. Y.

SALARIED PERSONNEL $3,000 — $25,000. This reliable service, established 1927, conducts confidential negotiations for high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. JIRA THAYER JENNINGS, Dept. S, 109 Church St., New Haven, Conn.

Opportunities

FOR SALE A FOUNDRY

land, buildings, machinery, stock and equipment. Located in Providence • Established 50 Years

RICHARD F. RICHARDSON

804 Turks Head Building
Providence 3, Rhode Island

LIGHT METAL FOUNDRY—PART OR ENTIRE San Francisco peninsula. 21,000 sq. ft., all modern facilities for sand and permanent mold magnesium and aluminum castings. Monthly capacity, 1,000,000 lbs. permanent mold, 300,000 lbs. sand casting. Well equipped Pattern Shop; 4 Lindberg Heat Treating Furnaces, Sand Mullers & Hoppers, Roll-over Machines, Heliarc Welding, Trimming Booths, Electric Conveyor systems, and special fire protection devices. Further details to principals only. Write Box 233, STEEL, Penton Bldg., Cleveland 13, O.

FOR SALE OR LEASE

5,000 Sq. Ft., Oilfired Steam Heat, Present equipment, 6 turret lathes, 1, 2⅜, 5 & 6" hole. Max. swing 36"; No. 2 Cincinnati Centerless; No. 1 to No. 6 taper drill presses; 20 other machine tools individually motorized. Excellent skilled and unskilled labor market. Location central for auto parts production or your own product. Contact Grain Processors Corporation, Linden, Michigan, Phone 10.

Representatives Wanted

MANUFACTURER'S REPRESENTATIVE needed to fill vacancy. Clientele following desirable in short-run metal stampings. Write Box 223, STEEL, Penton Bldg., Cleveland 13, O.

SPECIAL MANUFACTURERS TO INDUSTRY . . . *Since 1905*

Metal Specialties comprised of STAMPINGS, FORMING, WELDING, SPINNING, MACHINING. All Metal or Combined with Non-Metal Materials

WRITE FOR FOLDER
LARGE SCALE PRODUCTION
OR PARTS AND DEVELOPMENT ONLY

GERDING BROS.

SE THIRD VINE ST. ● CINCINNATI 2, OHIO

NO TUBING PROBLEM TOO TOUGH!

Send Us Your Inquiry

We fabricate tubing up to ¾" OD in any metal. Tough jobs and short runs that the other fellow doesn't want are solicited. Tubes can be bent, flared, beaded, soldered by modern induction heat, or have other operations performed to your print. Write, wire or call FRANKLIN PRODUCTS COMPANY, 6750 Orchard Lake Road, Franklin, Mich. Phone, Pontiac 8090.

ALMA PAYS THE FREIGHT

- Job Machining
- Production Machining
- Automatic Screw Machining
- Heat Treating—Welding
- Tools—Jigs—Fixtures—Gages
- Special Machinery
- Designing—Engineering
- Complete Assemblies
- Modern Factory

Send In Your Blue Prints For Quotation.

ALMA MOTOR COMPANY

Office—1434 National Bank Bldg.
Telephone, Clifford 2716
Detroit 26, Michigan

ADVERTISING INDEX

A

A & A Machinery 168
Air Reduction 45
Allegheny Ludlum Steel Corporation 42
Allied Structural Steel Companies 46
Allis-Chalmers Mfg. Co. 15
Alma Motor Co. 171
Aluminum Company of America 122, 123
American Chain & Cable, American Chain Division 134
American Chain & Cable, Wire Rope Sling Department 38
American Chain Division, American Chain & Cable 134
American Nickeloid Co. 133
American Roller Bearing Co. 155
American Steel & Wire Co. 29
Anaconda Wire & Cable Co. 104
Avondale Marine Ways, Inc. 119

B

Babcock & Wilcox Co., The, Refractories Division 115
Baldwin Locomotive Works, The, Standard Steel Works Division 41
Basic Refractories, Inc. 5
Belmont Iron Works 166
Bethlehem Steel Co. 1
Beverly Shear Mfg. Co. 158
Bixby, R. W., Inc. 171
Blaw-Knox Co., Pittsburgh Rolls Division 25
Brooke, E. & G., Iron Co. 166
Browning, Victor R., & Co., Inc. 167
Burt Mfg. Co., The 151

C

Chicago Metal Hose Corporation 110
Chicago Perforating Co. 164
Cincinnati Milling Machine Co., The 67
Cleveland-Cliffs Iron Co., The 22
Clinton Bridge Works 46
Columbia Steel Co. 29
Coulter, James, Machine Co., The 163
Cowles Tool Co. 164

D

Danielson Safety Valves, Inc. 136
Danly Machine Specialties, Inc. 112, 113
Detroit-Leland Hotel 156
Differential Steel Car Co. 167
Dresser Industries, Inc. 101
Dulien Steel Products, Inc. 169
Du Pont, E. I., de Nemours & Co., Inc. .. 27

E

Economy Co., Inc. 169
Elwell-Parker Electric Co., The 107
Enterprise Galvanizing Co. 166
Erdle Perforating Co., The 167

F

Federal Machine & Welder Co., The 75
Ferracute Machine Co. 35
Foster, L. B., Co. 169
Frank, M. K. 169
Furnace Engineers, Inc. 166

G

Gage Structural Steel Co. 46
Gerding Bros. 171
Gibson, William D., Co., The, Division of Associated Spring Corp. 14
Gisholt Machine Co. 7
Granite City Steel Co. 12
Graybar Electric Co. 83

H

Hannifin Corporation 157
Hanson-Van Winkle-Munning Co. 20
Harnischfeger Corporation 48, 49
Harrington & King Perforating Co., The .. 154
Harrisburg Steel Corporation 165
Haynes Stellite Co. 47
Heil Process Equipment Co. 167
Hendrick Manufacturing Co. 157
Hevi Duty Electric Co. 152
Hewitt Rubber of Buffalo, Division of Hewitt-Robins, Inc. 130
Hubbard, M. D., Spring Co. 161
Hyatt Bearings Division, General Motors Corp. 72
Hy-Test Division, International Shoe Co. .. 19

I

Ingalls Iron Works Co., The 21
Inland Steel Co. ..... Front Cover, 55
International Nickel Co., Inc., The 52
International Shoe Co., Hy-Test Division .. 19

J

Jackson Iron & Steel Co., The 166
James, D. O., Manufacturing Co. 161
Jira Thayer Jennings 171
Johns-Manville 23
Jones & Lamson Machine Co. 99
Jones & Laughlin Steel Corporation 103

K

Kline Iron & Metal Co. 169

L

Landis Machine Co. 13
Leschen, A., & Sons Rope Co. 163
Lewis Machine Co., The 166
Linde Air Products Co., The 11, 39
Littell, F. J., Machine Co. 159
Logan Platers, Inc. 164
Los Angeles Sheet Metal Mfg. Co. 170

M

Macwhyte Co. 3
Master Electric Co., The 125
Matthews, Jas. H., & Co. 164
Midland Structural Steel Co. 46
Monarch Machine Tool Co., The 50

N

National Cylinder Gas Co. 36, 37
National Steel Corporation 33
New Britain Machine Co., The 10
New York & New Jersey Lubricant Co. 28

O

Ohio Galvanizing & Mfg. Co., The 167
Ohio Locomotive Crane Co., The 166
Orton Crane & Shovel Co. 2

P

Parker-Kalon Corporation 34
Paul & Beekman, Inc. 135
Paxson Machine Co. 154
Pedrick Tool & Machine Co. 163
Phillips Screw Manufacturers 43
Pittsburgh Commercial Heat Treating Co. .. 164
Pittsburgh Gear & Machine Co. 167
Pittsburgh Lectrodryer Corporation 18
Pittsburgh Rolls Division of Blaw-Knox Co. 25

R

Ready-Power Co., The 129
Reliance Electric & Engineering Co. ..... Inside Front Cover
Republic Steel Corporation 6
Robins Conveyors, Inc., Division of Hewitt-Robins, Inc. 130
Roebling's, John A., Sons Co. 16, 17
Ross Heater & Mfg. Co., Inc. 153
Russell, Burdsall & Ward Bolt & Nut Co. .. 97
Ryerson, Joseph T., & Son, Inc. 56

S

Shenango-Penn Mold Co. 44
Shreve, Anderson & Walker 127
Simonds Gear & Mfg. Co., The 165
Standard Machinery Co. 167
Standard Steel Works Division, The Baldwin Locomotive Works 41
Stanley Works, The 166
Stanwood Corporation 156
Strom Steel Ball Co. 159
Sun Oil Co. 81

T

Taylor-Wharton Iron & Steel Co. 165
Tennessee Coal, Iron & Railroad Co. 29
Tide Water Associated Oil Co. 32
Timken Roller Bearing Co., The .. Back Cover
Toledo Stamping & Manufacturing Co. ... 166
Tri-Boro Steel Supply Co., Inc. 137
Tubular Service Corporation 166

U

Union Carbide & Carbon Corporation 11, 39, 47
Unit Crane & Shovel Corp. 161
United States Steel Corp., Subsidiaries .. 29
United States Steel Export Co. 29
Upton Electric Furnace Div. 120

W

Warner & Swasey 30, 31
Washburn Wire Co. 26
Washington Steel Corporation 24
Weirton Steel Co. 33
Westinghouse Electric Corporation 109
Wheeling Steel Corporation 167
Wheland Co., The 168
Whitcomb Locomotive Co., The 9
Willson Products, Inc. 40
Wilson, Lee, Engineering Co., Inc. ..... Inside Back Cover
Wire Rope Sling Department, American Chain & Cable 38

Y

Yoder Co., The 8

Z

Zeh & Hahnemann Co. 165

~ ~ ~

Table of Contents, Page 51

Classified Advertising Pages 169, 170, 171

This is a new WILSON Annealing Installation for High Carbon Strip and Wire Coils at the

JOHN A. ROEBLING'S SONS CO.

TRENTON, N. J.

The Wilson Annealing Unit is covered by Patents Nos. 1,952,402, 2,068,477, 2,078,356, 2,081,612, 2,089,843, and other patents pending.

ENGINEERED AND CONSTRUCTED BY

Lee Wilson

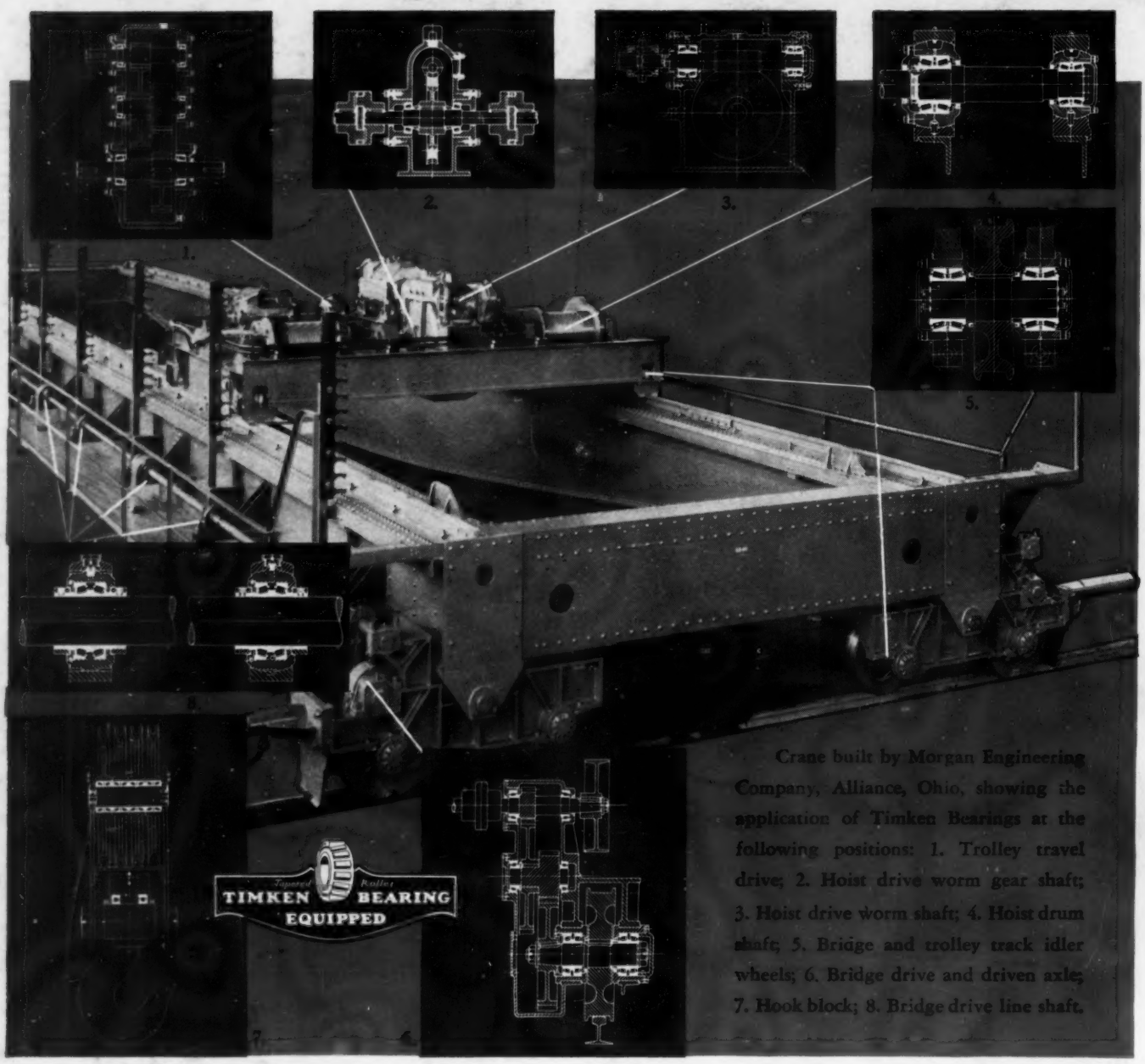
ENGINEERING CO., INC.

20000 West Lake Road . CLEVELAND, OHIO

Telephone ACademy 8070

INDUSTRIAL FURNACES • RADIANT TUBE HEATING • HEAT TREATING PROCESSES

Keep 'em Traveling with TIMKEN BEARINGS



Crane built by Morgan Engineering Company, Alliance, Ohio, showing the application of Timken Bearings at the following positions: 1. Trolley travel drive; 2. Hoist drive worm gear shaft; 3. Hoist drive worm shaft; 4. Hoist drum shaft; 5. Bridge and trolley track idler wheels; 6. Bridge drive and driven axle; 7. Hook block; 8. Bridge drive line shaft.

A few Timken Bearings are better than none in any crane; even if you have them only in the bridge and trolley track wheels your cranes will perform better, last longer, cost less for upkeep.

In order to get the *full* benefits of Timken Tapered Roller Bearings however, you must have them *at every bearing position.* Then every moving part will be completely protected against friction; wear; radial, thrust and combined loads and misalignment. Then your cranes will consume less power; require less lubrication; operate faster; stand up longer; need less time out for maintenance.

When buying overhead cranes of any size and capacity for any purpose, it will pay you to specify Timken Tapered Roller Bearings for all positions including those listed above. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION